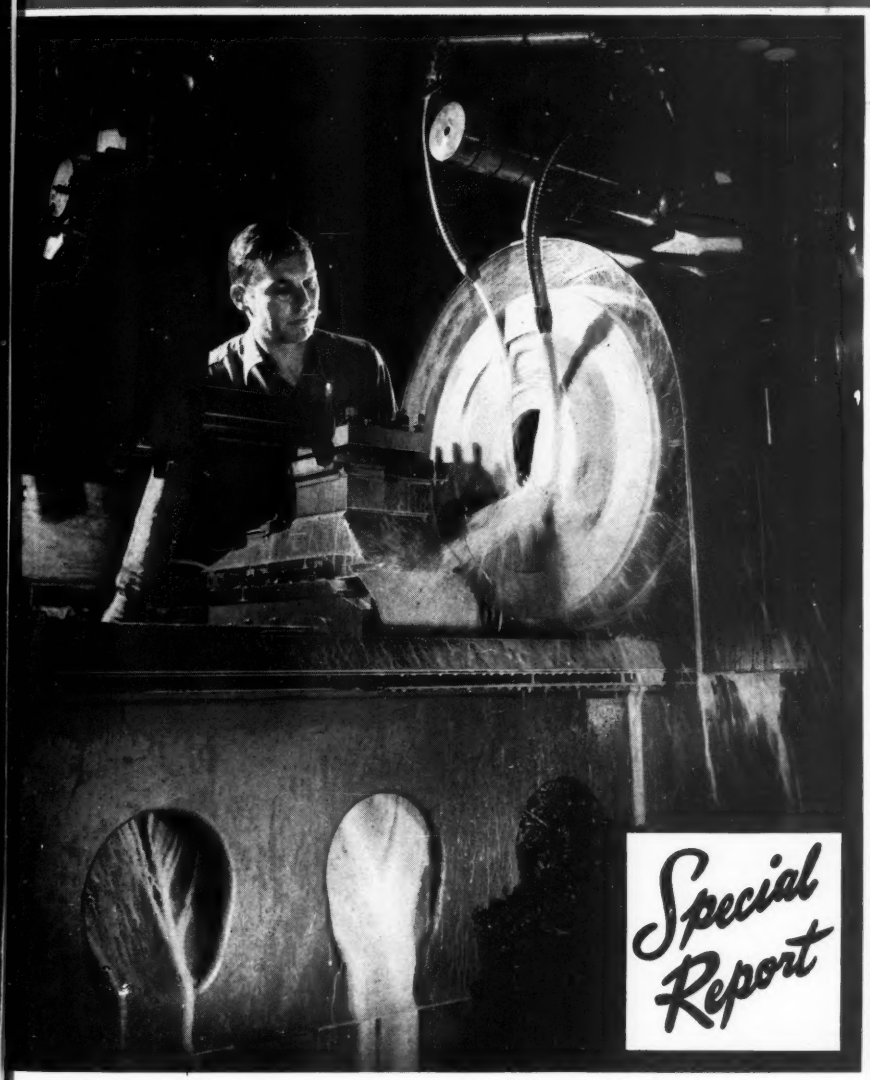
JUNE 23, 1952

STEEL

THE WEEKLY MAGAZINE OF METALWORKING

OHIO STATE UNIVERSITY
JUN 23 1952
LIBRARY



TTING FLUIDS: Mechanics to Consider in Selecting Them—page 72

STEEL INVENTORIES: TWO WEEKS
But Imbalances Worsen, p. 43

BONUS IN COPPER
What Will It Mean? p. 45

NODULAR IRON WELDS
Strong but Hard To Machine, p. 7

CONTENTS — PAGE 5

STEEL & ALUMINUM

WAREHOUSE SERVICE

1952

1943

3,000 sq. ft.

SATISFIED CUSTOMERS

built this growth in only 9 years!

In the short space of 9 years, Korhumel Steel and Aluminum Company has grown into one of the largest and most modern warehouse operations in the country. A long and impressive list of satisfied customers is responsible for this sensational growth.

What's the secret behind it? There is no secret . . . just good service—treating customers the way we'd like to be treated. During our nine years in business we have expanded our service and facilities so that we can offer customers more than ordinary warehousing service. For instance, we added gas-fired bright annealing furnaces, a modern 3-stand cold reduction mill, plus batteries of slitting, shearing and edging machines. These are all extra services we know our customers like because they provide fast, economical ways to simplify production planning, and eliminate inventory and storage problems.

We'd like to have you join our list of satisfied customers. Korhumel Sales Engineers in your territory will show you how this service can help you save time and money. Look in your classified telephone directory for your nearest Korhumel Representative—call him today or write us now!

STEEL

Cold and Hot Rolled Strip and Sheet
Spring Steel
Feeler Gauge
Round Edge Flat Wire
Shim Steel
Phosphor Bronze
Electro Galvanized
Electrical Sheets
Tin Plate
Black Plate
Bright Basic Wire
Cold Finished Bars
Drill Rod
Steel Tubing, Seamless and Welded
Rigidtex Stainless

ALUMINUM

Strip and Sheet
Coils
Straight Lengths
Bars
Tubing

SERVICES

Slitting
Shearing
Edge Rolling
Bright Annealing
Cold Rolling

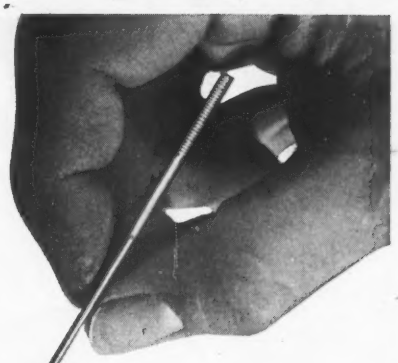
KORHUMEL

STEEL & ALUMINUM CO.

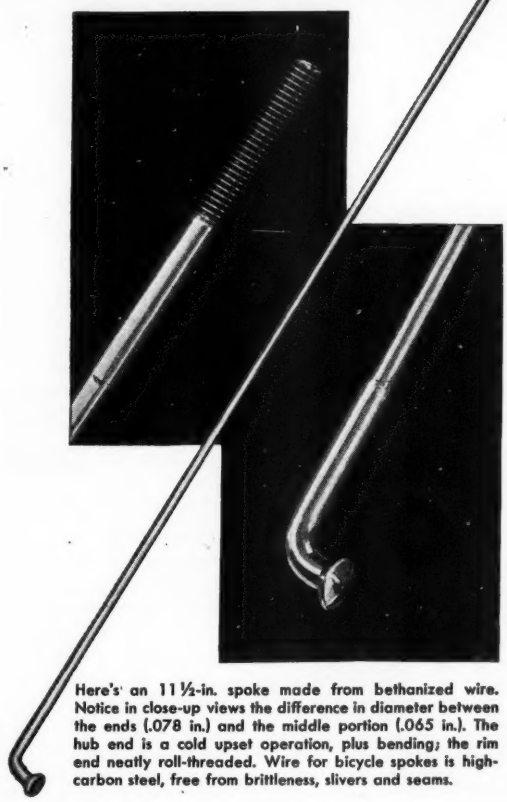
2426 OAKTON STREET, EVANSTON, ILLINOIS

AMbassador 2-6700

Warehouses and Sales Offices in Minneapolis • Milwaukee • Detroit
Los Angeles • Indianapolis • St. Louis • Toledo • Cincinnati • New York



Bicycle Spokes...Good Exercise for Bethanized Wire



Here's an 11½-in. spoke made from bethanized wire. Notice in close-up views the difference in diameter between the ends (.078 in.) and the middle portion (.065 in.). The hub end is a cold upset operation, plus bending; the rim end neatly roll-threaded. Wire for bicycle spokes is high-carbon steel, free from brittleness, slivers and seams.

From the moment it spins off the coil, wire used for bicycle spokes takes a beating. Forming operations call for swaging, upsetting, threading and bending. Later, as a hard-working spoke, the wire must shake off kicks, collisions and, toughest of all, corrosion.

Manufacturers choose bethanized wire for rugged jobs because it comes through severe fabrication without losing its smooth good looks or its ability to fight rust.

Bethanized wire's top feature is its zinc coating —99 pct pure, of uniform thickness, highly ductile, and tightly adhering to the steel base. Bend the wire, twist it, even draw it through a series of dies —the zinc doesn't crack, flake or peel. Rust finds no inviting thin spots anywhere along the wire.

Next time you have a difficult forming job or a corrosion problem, try bethanized wire. The nearest Bethlehem sales office will be glad to give you more information. Or write to us at Bethlehem, Pa.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

LESSON IN ECONOMY

with TOCCO* Induction Heating

● When a leading motor truck manufacturer switched to TOCCO for surface hardening steering knuckle pins, they not only cut the cost of the part in half, but reduced heat-treating time from 17 hours to 48 seconds!

● Using TOCCO they were able to combine two operations and eliminate four others completely. Moreover, the TOCCO unit, being located right in the production line next to related operations, saves approximately 4000′ of hauling to and from the heat-treat department – an important economy factor not included in the above figures.

● If your operations involve the hardening, brazing, soldering, melting or forging of ferrous or non-ferrous metals, TOCCO can probably speed up *your* production and lower *your* costs, too. Why not ask to have a TOCCO engineer survey your plant for similar cost-cutting results—without obligation.

SEE OUR CATALOG IN SWEET'S FILE

THE OHIO CRANKSHAFT COMPANY

TOCCO

*Trade Mark Reg. U. S. Pat. Off.

Mail Coupon Today

NEW **FREE** BULLETIN

THE OHIO CRANKSHAFT CO.
Dept. S-6, Cleveland 1, Ohio

Please send copy of "Typical Results of TOCCO Induction Hardening and Heat Treating"

Name_____

Position_____

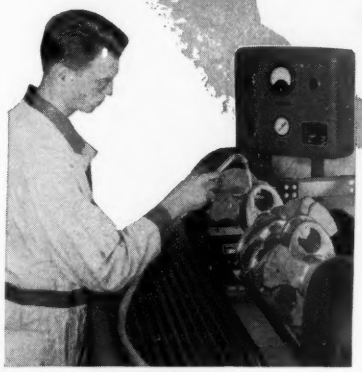
Company_____

Address_____

City_____ Zone____ State_____

Announcing Nationwide MAGNAFLUX

Commercial Inspection Service



Low-cost parts inspection for smaller plants—fleet overhaul—specified inspection

For plant and field inspection of large equipment anywhere

MAGNAFLUX
Laboratory Inspection

Serves as *your* inspection department to whatever extent you require or desire, at any stage of processing or production. Available through 11 Magnaflux Corp. Laboratories.

MAGNAFLUX
Field Inspection

Prevents unpredicted failure in critical production, construction and erection equipment by timely detection of faulty welds, fatigue cracks, fractures, etc. Ready to serve you in your plant or in the field anywhere in the United States.

THIS MAGNAFLUX-OWNED and OPERATED SERVICE offers you full facilities for non-destructive testing and inspection, where limited use or special requirements make investment in inspection equipment impractical.

It makes available to you *all* the inspection methods of Magnaflux Corporation: MAGNAFLUX, MAGNAGLO, ZYGLO—the "big 3" used by more industries, for more inspection operations than all other methods combined—as well as STATIFLUX, PARTEK, SONIZON and STRESSCOAT. One or another of these methods may be applied to magnetic or non-magnetic metals, glass, ceramics and other materials.

Magnaflux Commercial Inspection includes both Laboratory Inspection of parts—from one to 1,000,000—and Field Inspection of machinery and equipment *anywhere*.

By detecting defects *before* they waste materials, manpower or production time...by making invisible defects visible *before* machinery breaks down in service, Magnaflux Commercial Inspection is saving money for hundreds of companies. It is also preventing needless rejection of materials or parts for *seeming* defects that are actually harmless to service life.

If you have an inspection problem

—or must meet contract requirements for inspection—these booklets may help you with the practical solution. Mail coupon for either or both.

MAGNAFLUX

DETECTS DEFECTS

MAGNAFLUX CORPORATION

Reg. U. S. Pat. Off.

Commercial Inspection Available Through 11 Principal Cities:
New York 23 • E. Hartford, Conn. • Chicago 47 • Cleveland 15
Detroit 11 • Witchita, Kan. • Dallas 9 • Houston, Texas
Los Angeles 58 • Oakland 6 • Odessa, Texas

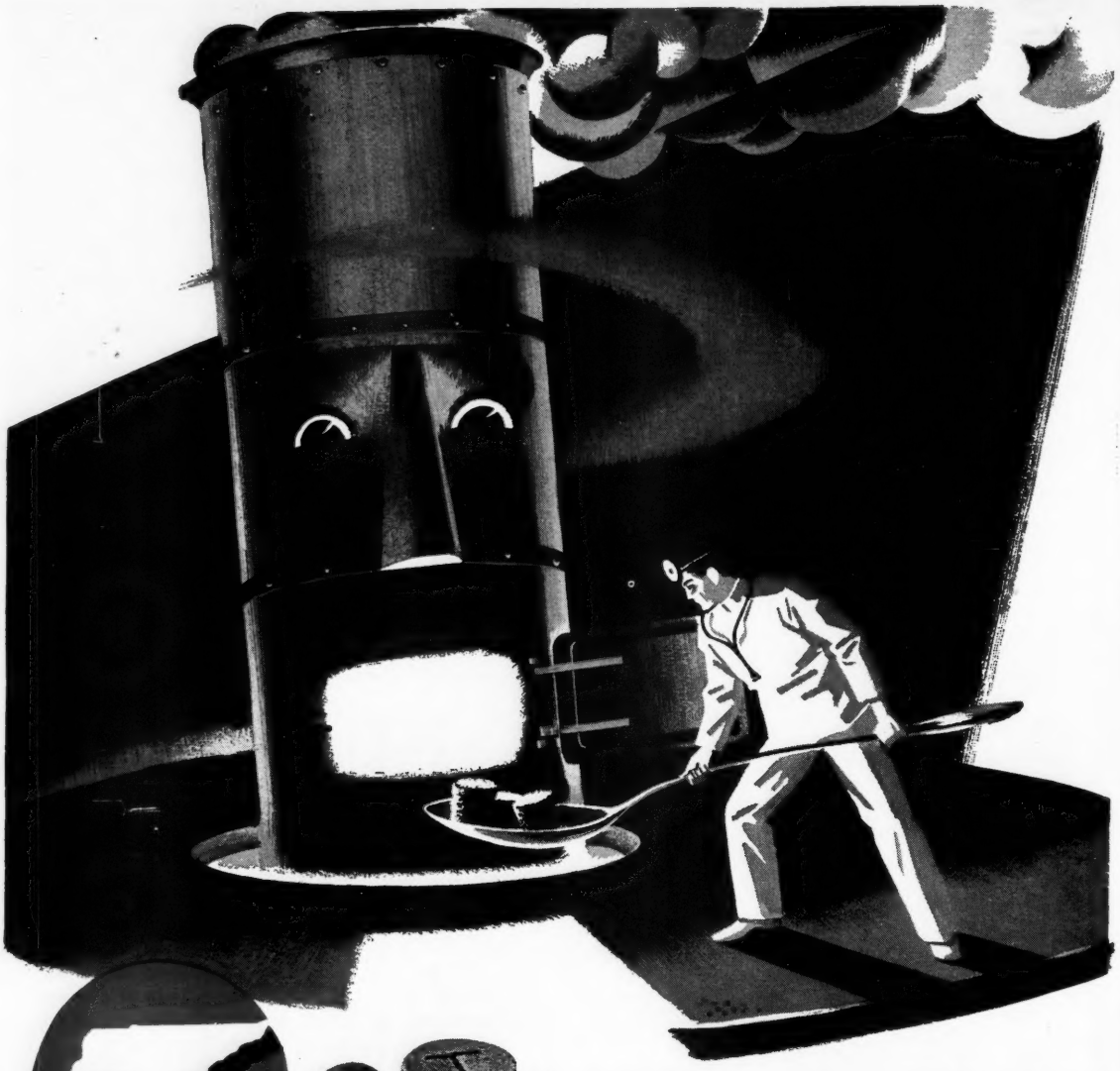
MAGNAFLUX CORPORATION
5912 Northwest Hwy., Chicago 31, Illinois
Please send me a copy of your bulletin on:
☐ Laboratory Inspection
☐ Field Inspection

*Name*_____

*Company*_____

*Address*_____

*City*_____ *Zone*____ *State*_____



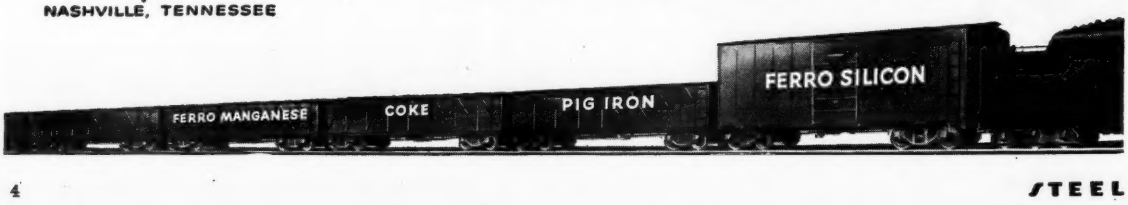
CAPSULES FOR CUPOLAS

Ferrosilicon and ferromanganese briquettes speed up foundry charging operations by eliminating the need for time-consuming weighings. These convenient "capsules" contain exact amounts of either ferrosilicon or ferromanganese. It's easy to get the correct "dose" for the charge.

Ferrosilicon is available in lump, sized or powder form as well. And Tennessee Products also makes low phosphorus pig iron and high grade malleable pig iron for the metal industries.

For complete details, write Tennessee Products & Chemical Corp., First American National Bank Building, Nashville, Tenn.

TENNESSEE
PRODUCTS & CHEMICAL
Corporation
NASHVILLE, TENNESSEE



This Week in Metalworking

STEEL

Vol. 130 No. 25 June 23, 1952

✓NEWS ✓PRODUCTION-ENGINEERING ✓MARKETS

SPECIAL REPORT: What cutting fluids to use for best machining results. Page 72

✓**Metalworking Outlook** 35

As the Editor Views the News 39
In this time of incentive vs. security, Editor-in-Chief E. L. Shaner makes his discerning commentaries

Windows of Washington 50

Mirrors of Motordom 57
What's doing in the motor capital? Detroit Editor H. C. Tuttle points up significant control, production problems

The Business Trend 61

Men of Industry 65

✓**Production-Engineering News At a Glance** 71

Radiant Oven Adapts to Job 77
Prefab panels arrive on the job complete and ready for assembly into oven structures

Nodular Cast Iron Welds Hard To Machine 78
Study shows annealing after welding and a better welding method may eventually provide solution

Giant Tongs Expedite Turret Handling 80
Remote control from panel eliminates worker hazards and increases production of turrets for Army tanks

Progress in Steelmaking 82
Blast Furnace Practice XI (d) Beneficiation of Air. Oxygen enriched air: More output, less fuel

New Products and Equipment 127

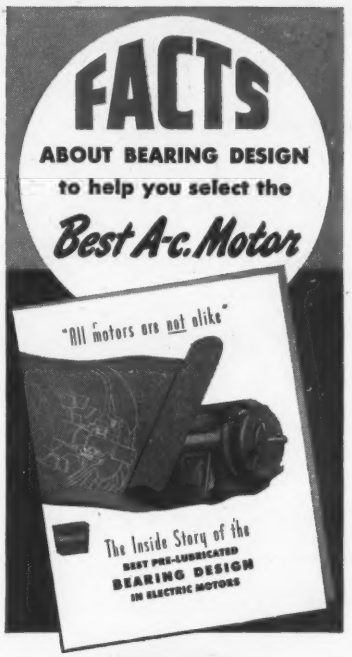
✓**The Market Outlook** 145
Metal Prices and Composites start on Page 146

The Metal Market 157

Behind the Scenes	6	Obituaries	68
Letters to the Editors	12	Calendar of Meetings	124
Subcontract Summary	48	Helpful Literature	141
Checklist on Controls	49	Here, There in Industry	167

Editorial, Business Staffs—10. Advertising Index—173. Editorial Index available semi-annually. STEEL also is indexed by Engineering Index Inc., 29 West 39th St., New York 18.

Published every Monday by the Penton Publishing Company, Penton Building, Cleveland 13, Ohio. Subscription in the United States and possessions, Canada, Mexico, Cuba, Central and South America, one year $10; two years $15; all other countries, one year $20. Single copies (current issues) 50 cents. Metalworking Yearbook issue $2.00. Entered as second class matter at the postoffice in Cleveland, under the Act of March 3, 1879. Copyright 1952 by Penton Publishing Co.



All in One Bulletin

15-POINT COMPARISON CHART

STATEMENTS BY BEARING MANUFACTURERS

CUTAWAY DRAWINGS AND PHOTOS

Call your nearest Reliance Sales Representative or write us direct for your free copy of this fact-filled bulletin on the vital differences in the bearing designs of A-c. motors. Ask for Bulletin B-2201.

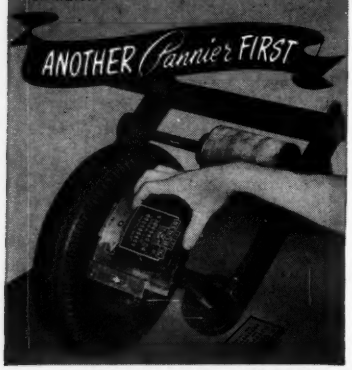
Sales Representatives in Principal Cities

RELIANCE
ELECTRIC AND ENGINEERING CO.
1081 Ivanhoe Road • Cleveland 10, Ohio

"All Motors are NOT Alike"

Print up to
2000 feet per minute
with the
NEW Pannier
AUTOMATIC SHEET
and STRIP
"Master Marker"
...make complete die change
in 30 seconds!

Pannier Engineers, through constant research and experimentation, have successfully developed a marking device for efficiently and automatically printing sheets and strip made from any kind of material.



CHECK THESE MONEY-SAVING ADVANTAGES:

- Prints *all* materials—any thickness.
- Driven by product or conveyor at production-line speed—up to 2000 feet per minute with safety. (Wheel need not ride on product.)
- Complete brass-back die held by spring pin—quickly and easily changed.
- Interchangeable Dovetail National Type for heat numbers, etc.
- One or two dies—any spacing required.
- Felt ink roll with enclosed bearings—inked from face—adjustable to die thickness.
- Adjustable-set-screw-collar crossbar mounting.
- Adjustable die pressure—remains constant despite product irregularities.
- Full counterweight on drive wheel axle for perfect balance.
- Friction drive, Alemite-lubricated-roller-bearing wheel with 30-35,000-mile-life rubber tire.
- Fully guaranteed. **Pat applied for*

Write for FREE Bulletin

OFFICES: Chicago, Ill. • Los Angeles, Calif. Jacksonville, Fla. • Youngstown, Ohio Philadelphia, Pa.

EXPORT DEPT.: Bessemer Bldg., Pittsburgh, Pa.

The Pannier Corporation
220 PANNIER BUILDING
Pittsburgh 12, Pa.

Behind the Scenes...

Reply

The poet laureate of this column, Pat Dwyer Jr., turned to prose a while back. The occasion was a letter from his congresswoman, Francis P. Bolton, congratulating him on the ownership of a new house in her district.

Pat reports: "She invited me to select some of the free literature she had made available to new home owners in her district. The literature concerned tactics against insects, instruction in lawn-making, tree-planting, heady information about sexual functions of flowers, advice in the matter of patching work clothes and a remarkable assortment of precepts and procedures of inestimable value to mortgagors.

"I checked off a few titles—'The Care and Feeding of Japanese Beetles,' 'How to Process Mare's Milk,' 'The Cockroach and You'—and sent the list to her, together with a friendly note. I told her I was firmly opposed to paternalism, but I wouldn't mind learning the official attitude toward the cockroach."

Pat expected merely a stereotyped reply, but instead received a personal note from Mrs. Bolton who thanked him for his "heartwarming" letter and took the occasion to recall that she had been much impressed with STEEL's article on "Metalworking's Destiny," which appeared in the annual issue, Jan. 7, 1952. So impressed with it was she that she had it reprinted in the Mar. 20 *Congressional Record,* beginning on p. A1834.

Writer

Signs in a diner in Augusta, Ga.: "Patronize us or we'll vote for Harry." "We have no quarrel with those who sell for less. They know what their stuff is worth."

Home To Roost

STEEL's stories sometimes come home to roost. Late in May, Engineering Editor Walt Toerge had announced his plans to American Gear Manufacturers Association to attend and cover their annual meeting June 1-4 in Hot Springs, Va.

AGMA had a routine mailing to all people who had told it they were attending, and that mailing was sent to Walt. It contained the usual information about the program, room reservation forms—and a copy of a reprint of "So You're Going to a Convention," a two-page story STEEL worked up for the Sept. 3, 1951 issue. It tells how to budget your time and get the most out of a convention.

Red Line Blues

Last week the editors of STEEL got caught with their red line down. The industrial production index on the Business Trend page suddenly dropped from 203 to 163 due to the steel strike. Last line on the graph is at 165.

Thus the dilemma. Should the line drop off the graph to 163 or should it stop at 165? For the sake of accuracy it went to 163, dangling into the white area.

Starting with this issue a revamped chart is used and is ready for all comers.

Puzzle Corner

The grocer weighing sugar loses in the problem of June 9, and the more his scales are out the more he loses. First in with that answer was T. S. Bean of Barber & Ross Co. The reason for that loss is complex and we'll not go into it here.

Here's a problem submitted by George W. Frederick of Republic Steel Corp.: A farmer decides to distribute a tract of land among his sons and their wives. He has 16 sons and each son has a wife. The farmer gives the first son a certain amount of land and gives his wife 1/17 of what remains. He gives the second son one acre more than he gave the first and gives his wife 1/17 of what remains. He continues this, each son getting one acre more than the one preceding and each wife getting 1/17 of the remainder. When the last couple has been taken care of, the land is all distributed and it is found that each couple has an equal number of acres of land. How many acres were distributed?

Shrdlu

(Metalworking Outlook—Page 35)

The Situation is Gripping ....

SHARON* QUALITY ALLOYS SPECIFIED FOR VARIETY OF MULTI-PURPOSE CLAMPS

The demand we have today for high speeds has made the aircraft clamp an important item. It must withstand tremendous heat and vibration without failure or loss of efficiency. It must be light in weight — yet tough and strong; it must be made to allow for split second disassembly. Working with a leading clamp manufacturer, Sharon has developed and produced a clamp steel that meets or surpasses every maximum requirement. If your particular situation calls for stainless, coated or special alloy strip steel you should know the Sharon representative nearest you.

*Specialists in STAINLESS, ALLOY, COLD ROLLED and COATED Strip Steels.

SHARON STEEL CORPORATION

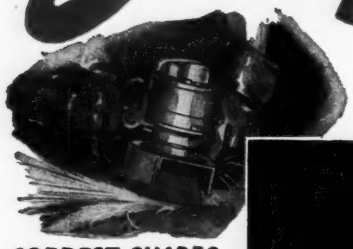
Sharon, Pennsylvania

DISTRICT SALES OFFICES: CHICAGO, ILL., CINCINNATI, O., CLEVELAND, O., DAYTON, O., DETROIT, MICH., INDIANAPOLIS, IND., MILWAUKEE, WIS., NEW YORK, N. Y., PHILADELPHIA, PENNA., ROCHESTER, N. Y., LOS ANGELES, CALIF., SAN FRANCISCO, CALIF., MONTREAL, QUE., TORONTO, ONT.

For information on Titanium contact Mallory-Sharon Titanium Corp., Niles, Ohio

SHARONSTEEL

STERLING-THE BETTER A PORTABLE GRINDING AT

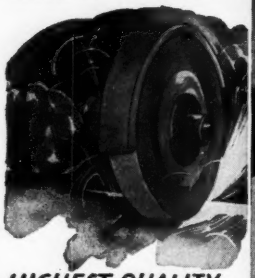


CORRECT SHAPES

TAILOR MADE

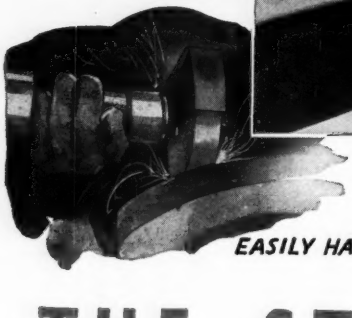
LONGER LASTING

FASTER



HIGHEST QUALITY

SHOCK ABSORBING



EASILY HANDLED

"THE WHEELS OF INDUSTRY"
STERLING GRINDING WHEELS
Plus VALUE
ABRASIVE PRODUCTS FOR
• BETTER GRINDING
• FASTER GRINDING
• LOW COST GRINDING

THE STERLING GRINDING
OF THE CLEVELAND

...AND FASTER WAY TO DO ...AT THE LOWEST POSSIBLE COST!

These superior, high-speed "Wheels of Industry" combine special bonds and abrasive grains to provide efficient, economical grinding of castings.

Sterling's F or P Bonds, with special, hard, sharp abrasive grains in proper sizes, offer proper specifications for better portable grinding of gates, risers and fins, welds, pipe, bar stock, sheet metal, billets, etc.

Sterling Portable, High-Speed, Resinoid Grinding Wheels handle easily on the job . . . they do the work, not the operator! There is no need to "bear down" to get better production . . . these wheels are carefully built to accomplish much in a shorter time without operator fatigue.

Try them before you buy them! A test run, under conditions you select, will readily prove the natural superiority of these Sterling wheels for any roughing or finishing operation in your plant. Write us at no obligation!

BEST IN THE TEST — THAT'S STERLING

A Sterling cup wheel, size 8x1x⅝, specification KA146 P6 B4, was tested against competitive brands in a well known plant grinding steel castings. The Sterling "Wheel of Industry" was much better than the other wheel—offered much longer life and faster stock removal.

Such results are not unusual. In your own plant, Sterling Grinding Wheels will give you extra values far beyond what you would ordinarily expect. Our engineers wait the opportunity to serve you with a wheel test or complete grinding survey of your equipment . . . no obligation, of course!

Ask for These Free STERLING Research and Development Folders...

In these folders you have an interesting bird's eye view of all types of grinding procedures. If you are interested in knowing the proper wheel to use on various kinds of grinding, these folders will quickly tell you. In addition, there will be sent you the popular "Art and Science of Grinding" now in its fifth edition. Write us on your company letterhead and we will do the rest.

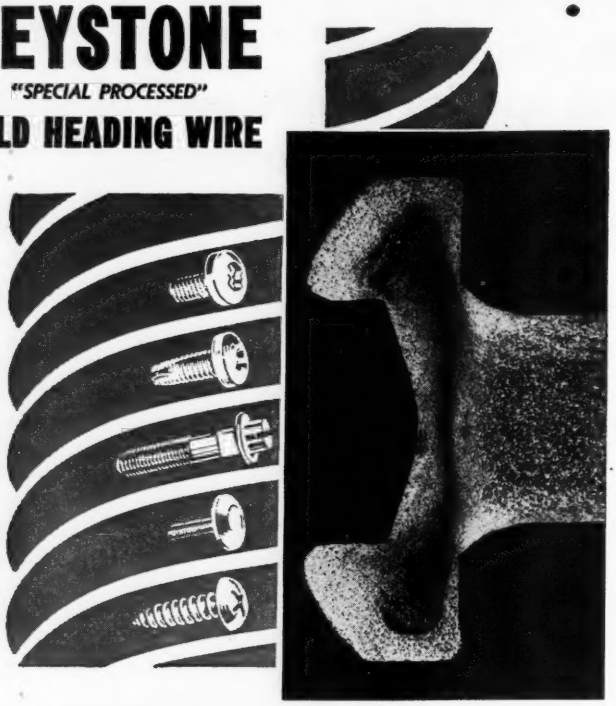
WHEEL DIVISION QUARRIES COMPANY **TIFFIN OHIO**

Flows without a flaw...

KEYSTONE

"SPECIAL PROCESSED"

COLD HEADING WIRE



The drastic displacement of metal during the cold heading of recessed clutch head screws requires special wire that will flow with unbroken fibres. The above macrograph clearly indicates long, unbroken flow lines in a clutch pan-head screw made from Keystone "Special Processed" Cold Heading Wire.

Carefully selected ingredients—our own exclusive drawing and heat treating process—rigid quality controls and inspections—give Keystone "Special Processed" Wire unsurpassed performance in unusually difficult cold heading problems.

INDUSTRIAL WIRE SPECIALISTS

Keystone Steel & Wire Company

PEORIA 7, ILLINOIS

STEEL

EDITORIAL STAFF

Editor-in-Chief ..... E. L. SHANER
Editor ..... IRWIN H. SUCH
Managing Editor ..... WALTER J. CAMPBELL
Market Editor ..... WM. M. ROONEY
Engineering Editor ..... WALTER TOERGE
Steel Plant Editor ..... J. D. KNOX
Consulting Editor ..... ALLEN G. GRAY
Art Editor ..... DON S. CADOT

Associate Editors:

FRANK R. BRIGGS, JAY DEEULIS
VANCE BELL, JOHN S. MORGAN
EDWARD C. BIRKNER

Assistant Editors:

WILLIAM R. WOLFE
DOLORES K. MAILLE, M. T. BORGERHOFF
ARTHUR W. ZIMMERMAN, ROBERT E. HALL
JOHN KELSEY, ROBERT O. JAYNES
ROBERT F. HUBER, FLOYD G. LAWRENCE
L. J. SKUDERIN

Resident Editors:

Washington ..... E. C. KREUTZBERG
New York ..... B. K. PRICE, L. E. BROWNE
SAMUEL W. BAKER
Pittsburgh ..... EDWIN L. KARPICK
Detroit ..... H. C. TUTTLE
Chicago ..... E. F. ROSS
London, European Editor VINCENT DELPORT

Editorial Correspondents:

Birmingham, R. W. Kincey; Buffalo, L. G. Feldmann; St. Louis, Mac L. Hutchens; Youngstown, George R. Reiss; Los Angeles, Norman Lynn; San Francisco, Edwin Haverty; Seattle, R. C. Hill; Dallas, C. K. Cates; Toronto, F. S. Tobin; Birmingham, Eng., J. A. Horton; Paris, France, Leon Jaudoin; Liege, Belgium, Jacques Foulon; Dusseldorf, Germany, Herbert Gross.

BUSINESS STAFF

Business Manager ..... J. W. ZUBER

Advertising:

Service Manager ..... C. H. BAILEY
Production Manager ..... A. V. ANDERSON
New York E. W. KREUTZBERG, K. A. ZOLLNER
CALVIN FISHER JR.
Pittsburgh .. S. H. JASPER, H. G. ROWLAND
J. C. SULLIVAN, T. R. WARREN
Chicago .... L. C. PELOTT, W. L. POLAND
Cleveland .. D. C. KIEFER, H. G. ROWLAND
C. A. TALLINGER, E. L. FRANKE
Los Angeles ..... F. J. FULLER
Griffin, Georgia ..... FRED J. ALLEN

Market Research and Promotion:

Promotion, Research Mgr. .. S. F. MARINO
Market Statistics ..... GEO. J. AUNER
Mail & List Service ..... BETTY HINTON

Circulation Department:

Manager ..... G. R. EBERSOLE
Field Represent. .. H. R. DUNNE, C. A. PRICE

Main Office:

Penton Building, Cleveland 13, Ohio
Main 1-8260

Branch Offices:

New York 17 ..... 60 East 42nd St.
Murray Hill 2-2581
Chicago 11 ..... 520 North Michigan Ave.
Whitehall 4-1234
Pittsburgh 19 ..... 2837 Koppers Bldg.
Atlantic 1-3211
Detroit 2 ..... 6560 Cass Ave.
Trinity 5-3024
Washington 4 .. 1123 National Press Bldg.
Executive 6849
Los Angeles 48 .. 6262 Commodore Sloat Dr.
Webster 1-6865
Griffin, Georgia ..... 331 South 12th St.
Griffin 7854
London, 2 Caxton St., Westminster, S.W. 1

Published by

THE PENTON PUBLISHING COMPANY

President and Treasurer ..... G. O. HAYS
Chairman ..... E. L. SHANER
Vice Pres., Director of Adv. .. R. C. JAENKE
Vice Pres. and Secretary .. F. G. STEINEBACH
Assistant Treasurer ..... R. W. COLEMAN

Also publisher of

FOUNDRY • MACHINE DESIGN
NEW EQUIPMENT DIGEST

CCA NBP

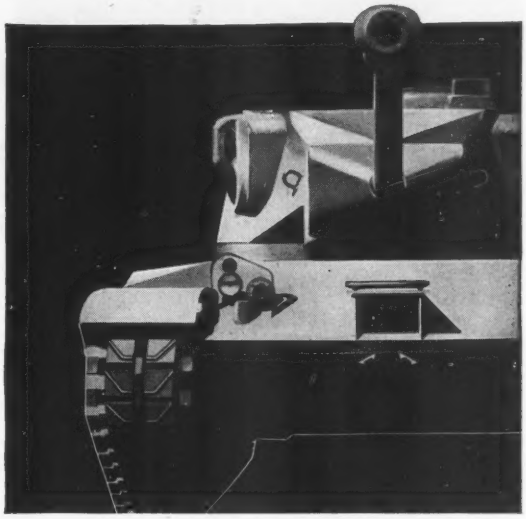
Member, Controlled Circulation Audit Inc., National Association of Magazine Publishers, Society of Business Magazine Editors, and National Business Publications Inc.

HOT Lacquer NEWS

PUBLISHED PERIODICALLY BY HERCULES POWDER COMPANY IN THE INTERESTS OF BETTER FINISHES AND FINISHING

New Ford Plant to Use Hot Lacquer For Finishing Army Tanks

Hot-Spray Process Avoids Installation of Baking Ovens in Ford's Livonia, Mich., Assembly Plant



The decision of Ford's Tank Division to use hot-spray lacquer exclusively for finishing tanks at its new Livonia, Michigan, plant points up, once again, the advantages offered by this time-saving and money-saving process. This fast-drying system, developed by The Ordnance Corp, includes a new nitrocellulose base primer, MIL-P-11414 (ORD).

The enthusiastic switch to hot lacquer in defense and other industries stems from the following reasons:

- finishing time is cut by as much as 50%
- expensive baking equipment is unnecessary
- Every pass of the spray gun assures more solids . . . greater thickness
- fewer coats are needed
- less solvent is used
- coverage per gallon is increased
- finish has better flowout
- blushing is eliminated

HERCULES POWDER COMPANY
INCORPORATED

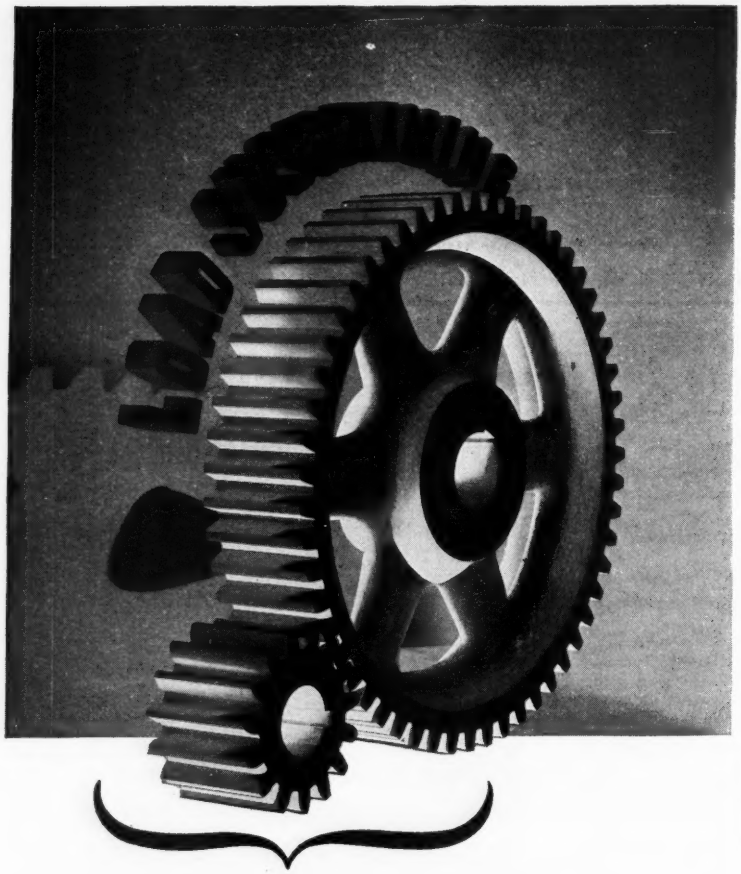
Cellulose Products Department

930 Market Street, Wilmington 99, Delaware

You'll want to read about the broader uses of lacquer for finishing defense items—and your own products. New military specifications for lacquer and primer are now issued and official. Identified as "Military Specification MIL-L-11195 (ORD) Lacquer, Lustreless, Hot-Spray (For Ammunition)" and "MIL-P Primer, Lacquer, rust inhibiting." Hercules will send you full information on hot lacquer, types of heating equipment available, and the performance record of hot lacquer in many industries. Send for it today.

CL-52-8

HERCULES DOES NOT MANUFACTURE LACQUERS OR HOT LACQUER EQUIPMENT, ONLY THE INGREDIENTS FROM WHICH LACQUERS ARE MADE



H & S gears are

EXTRA HEAVY FOR THE PITCH

● Built of the finest materials by skilled craftsmen, Horsburgh & Scott gears are accurate and husky. "Steel muscled" for hard work... rims, arms and hubs are extra heavy for the pitch. Outside diameter, faces and ends of hubs are smooth finished to the correct size. Pitch line is absolutely concentric with the bore. Teeth are accurately cut with the correct amount of backlash for smooth operation. Bores and keyseats are accurately and smoothly finished. They are built to stand the "gaff".

THE HORSBURGH & SCOTT CO.

GEARS AND SPEED REDUCERS

5112 HAMILTON AVE. • CLEVELAND 14, OHIO, U.S.A.

Send note on Company Letterhead for 488-Page Catalog 49

LETTERS

TO THE EDITORS

Blast Furnace Practice

I have just read the very interesting article "Blast Furnace Practice—VI(d)" (Mar. 17, p. 98) by Charles Agnew.

We are presently designing and engineering a new top charging foundry cupola, simulating the operation of a blast furnace. Please advise if copies of the above report are available to us for our reference and engineering use. We would greatly appreciate receiving them.

L. A. Glonet
Modern Equipment Co.
Port Washington, Wis.

We are interested in the series . . . will they be collected in some form when the series is completed?

P. A. Bartholonew
New Jersey Zinc Co.
Palmerton, Pa.

We would be very pleaed to know whether you will be issuing a booklet containing all these articles on their completion.

G. F. Powell
Steel Co. of Canada Ltd.
Hamilton, Canada

We are interested in obtaining 15 reprints of the series . . .

T. M. Jindra
U. S. Steel Co.
Chicago

● *The complete series will be available in reprint form soon. See the last article in the series, p. 82 of this issue, for how to get them.*

An Accolade

In our opinion your article "Powdered Metals" (Apr. 28, p. 56) was a very interesting and comprehensive one. It was particularly timely, too, in view of its appearance at the Metal Powder Show.

T. L. Robinson, president
Wel-Met Co.
Kent, O.

Who and Where Department

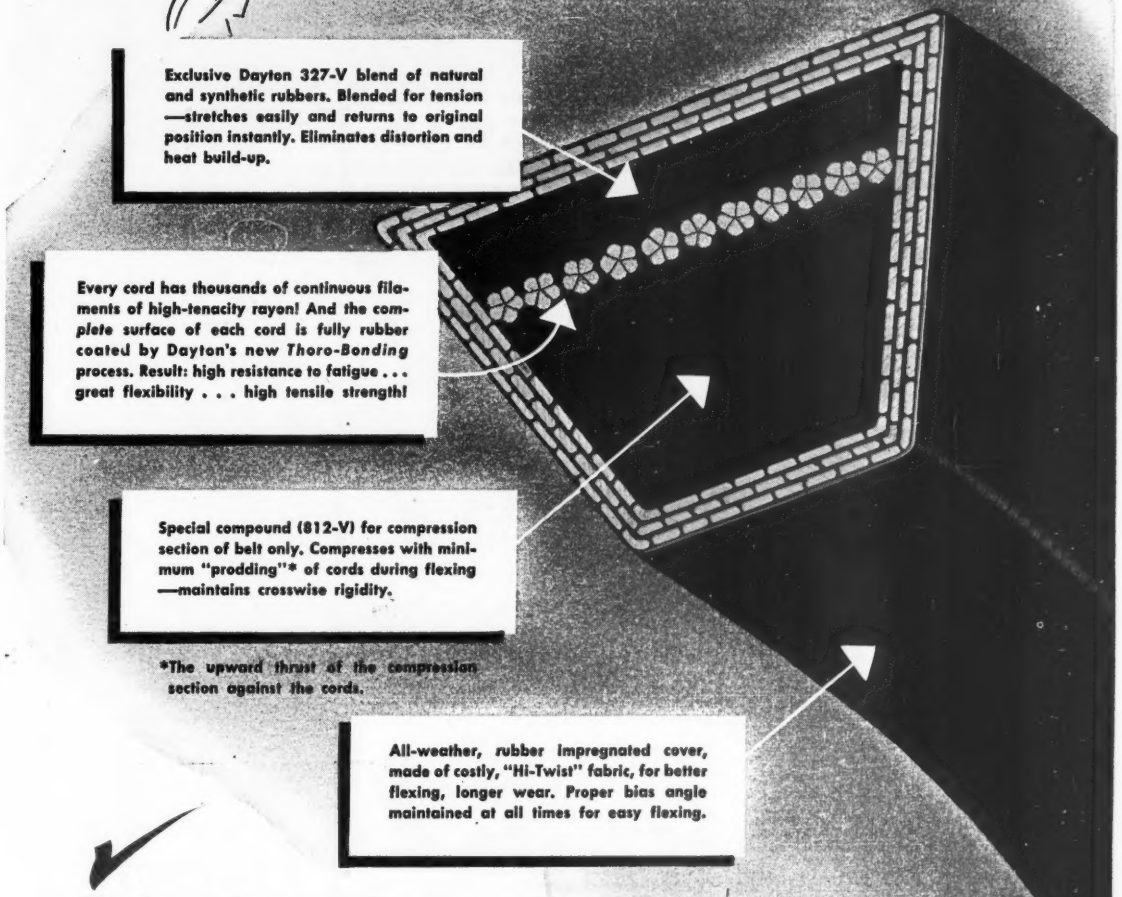
I would appreciate further information on your articles "Move Over Accountants" (Apr. 7, p. 113) and "Atomic Intimations" (April 7, p. 113).

Pedro Oller
Madrid, Spain

● *Write to Rogh L. Merritt, Battelle Memorial Institute, Columbus, O., for information on the computer story and to O. F. Ecklund, American Can Co., and Dr. J. E. Hobson, Stanford University, for information on "Atomic Intimations."*

SEE THE INSIDE STORY OF WHY

Dayton V-Belts last for YEARS!



Exclusive Dayton 327-V blend of natural and synthetic rubbers. Blended for tension —stretches easily and returns to original position instantly. Eliminates distortion and heat build-up.

Every cord has thousands of continuous filaments of high-tenacity rayon! And the *complete* surface of each cord is fully rubber coated by Dayton's new *Thoro-Bonding* process. Result: high resistance to fatigue . . . great flexibility . . . high tensile strength!

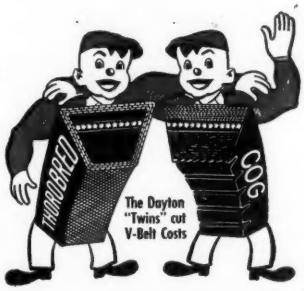
Special compound (812-V) for compression section of belt only. Compresses with minimum "prodding"* of cords during flexing —maintains crosswise rigidity.

***The upward thrust of the compression section against the cords.**

All-weather, rubber impregnated cover, made of costly, "Hi-Twist" fabric, for better flexing, longer wear. Proper bias angle maintained at all times for easy flexing.

Find out how much money this better belt can save you!

Ask your Dayton Distributor to give you the complete Inside Story of Dayton Thorobred Belts. His complete line of belts solves every drive problem! You'll find his name listed under "Belting" in your telephone directory.
Dayton Rubber Company, Dayton 1, Ohio.



Dayton Rubber

Since 1905

WORLD'S LARGEST MANUFACTURER OF V-BELTS

© D. R. 1952

STANDARDS and SPECIALS by the Millions

THE FERRY CAP & SET SCREW CO.

2159 SCRANTON ROAD • • • CLEVELAND 13, OHIO

"SHINYHEADS"

America's Best Looking Cap Screw

Made of high carbon steel — AISI C-1038 — to standards for Full Finished hexagon head cap screws — bright finish. Heads machined top and bottom. Hexagon faces clean cut, smooth and true, mirror finish. Tensile strength 95,000-110,000 p.s.i. Carried in stock.

"HI-CARBS"

Heat Treated Black Satin Finish

Made of high carbon steel — AISI C-1038. Furnished with black satin finish due to double heat treatment. Hexagon heads die made, not machined. Points machine turned; flat and chamfered. Tensile strength 130,000-160,000 p.s.i. Carried in stock.

"LO-CARBS"

Made of AISI C-1018 steel — bright finish. For use where heat treatment is not required and where ordinary hexagon heads are satisfactory. Hexagon heads die made to size — not machined. Points machine turned. Tensile strength 75,000-95,000 p.s.i. Carried in stock.

SET SCREWS

Square head and headless — cup point. Case hardened. Expertly made by the pioneers in producing Cup Point Set Screws by the cold upset process. Cup points machine turned. Carried in stock.

FILLISTER CAP SCREWS

Heads completely machined top and bottom. Milled slots — less burrs. Flat and chamfered machined point. Carried in stock.

FLAT HEAD CAP SCREWS

Heads completely machined top and bottom. Milled slots — less burrs. Flat and chamfered machined point. Carried in stock.

*

"SHINYLAND" STUDS

All studs made steam-tight on tap end unless otherwise specified, with flat and chamfered machined point. Nut end, oval point. Land between threads shiny, bright, mirror finish. Carried in stock.

ADJUSTING SCREWS

Valve tappet adjusting screws — Hexagon head style — to blue print specifications — hexagon head hard; polished if specified — threads soft to close tolerance — points machine turned; flat and chamfered.

*

*

CONNECTING ROD BOLTS

Made of alloy steel — heat treated — threads rolled or cut — finished to extremely close thread and body tolerances — body ground where specified. Expertly made by the pioneers in producing connecting rod bolts by the cold upset process.

SPRING BOLTS

Case hardened to proper depth and ground to close tolerances. Thread end annealed. Supplied in various head shapes, with oil holes and grooves of different kinds, and flats accurately milled.

FERRY PATENTED ACORN NUTS

For ornamental purposes. Steel insert — steel covered. Finish: plain, zinc plated, cadmium plated. Size: 9/16", 3/4", 15/16" across the flats.

Tapped 1/4" to 3/4" inclusive. Cross section of Ferry patented acorn nut, showing how steel hexagon nut fits snugly into shell.

Pioneers and Recognized Specialists, Cold Upset Screw Products since 1907

STANDARDS carried by LEADING DISTRIBUTORS

*

SPECIALS furnished to BLUE PRINT SPECIFICATIONS

WRITE FOR INFORMATION

SEND FOR SAMPLES

From the Filice & Perrelli Canning Co., Inc., Richmond, California, warehouse, an 80-case load is delivered to a terminal across the street.

TOWMOTORS IN ACTION IN U. S. INDUSTRY

quick as a flash . . .

Towmotor speeds from here to there, inside the plant and out, all day long. Speed handling, production, and deliveries with Towmotor fork lift trucks. For the name of your nearest Towmotor Representative and an illustrated brochure, "Handling Materials Illustrated," write Towmotor Corporation, Div. 16, 1226 E. 152nd Street, Cleveland 10, Ohio. Representatives in all principal cities in U. S. and Canada.

TOWMOTOR
THE ONE-MAN-GANG®

FORK LIFT TRUCKS AND TRACTORS

RECEIVING • PROCESSING • STORAGE • DISTRIBUTION

Don't rob yourself of top tool performance!

Black & Decker Service
is within 24 hours of you!

IF you have a B&D Tool that's not performing up to par, give it back the power, speed and accuracy with which it left the factory—with a fast, expert, economical repair job at the Black & Decker Service Branch nearest you!

These B&D Service Branches are company-owned-and-operated, not small repair shops "licensed" by a manufacturer. They offer factory-trained mechanics and genuine replacement parts.

B&D Service Branches interpret our Service Policy and Guarantee to your best interest. Black & Decker operates them for *your* convenience and lifelong satisfaction with B&D Tools. There's one within 24 hours of your plant, wherever it may be!

For service that saves on any B&D product, check the B&D Branch nearest you, listed below! THE BLACK & DECKER MFG. CO., 620 Pennsylvania Ave., Towson 4, Maryland.

LEADING DISTRIBUTORS EVERYWHERE SELL

B&D Black & Decker PORTABLE ELECTRIC TOOLS

WORLD'S LARGEST, MOST COMPLETE LINE

31 B&D Service Branches in U. S. and Canada . . . within 24 hours of any customer!

Atlanta 3, Ga. • Baltimore 11, Md. • Boston 35, Mass. • Buffalo 9, N. Y. • Charlotte 6, N. C. • Chicago 7, Ill. • Cincinnati 2, O. • Cleveland 15, O. • Dallas 1, Tex. • Denver 4, Col. • Detroit 2, Mich. • Houston 3, Tex. • Indianapolis 2, Ind. • Kansas City 8, Mo. • Los Angeles 7, Calif. • Memphis 3, Tenn. • Miami 37, Fla. • Milwaukee 13, Wisc. • Minneapolis 8, Minn. • Newark 5, N. J. • New Orleans 12, La. • New York 13, N. Y. • Philadelphia 30, Pa. • Pittsburgh 13, Pa. • Portland 9, Ore. • San Francisco 3, Calif. • Seattle 9, Wash. • St. Louis 10, Mo. *In Canada:* Toronto 2, Ont. • Montreal 14, P. Q. • Winnipeg, Manitoba.

Cone-Drive gears and speed reducers are "pre-shrunk" to fit them into up to ⅓ smaller space than you would normally have to allow for conventional gearing of the same load transmitting capacity.

The Cone-Drive manufacturing process sees to it that the worm is accurately wrapped around the wheel and the gear teeth in turn wrap around the worm.

This Cone-Drive "double-enveloping" design pre-shrinks a Cone-Drive gear set automatically to far smaller size than one would believe possible for the load it can carry.

To check this, just ask for the dimensions of a Cone-Drive gear set or reducer most nearly fitting your load and ratio requirements.

Then, if space-saving is one of your design objectives you can get a lot of help by simply reducing the gear space to match.

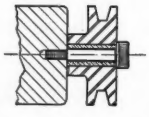
Available in many standard sizes and ratios, too.

CONE-DRIVE GEARS

DOUBLE ENVELOPING GEAR SETS & SPEED REDUCERS

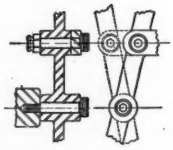
CONE-DRIVE GEARS
Division, Michigan Tool Company
7171 E. McNichols Road • Detroit 12, Michigan

UNBRAKO Shoulder Screw Applications



1. Stationary Shaft or Pivot

A. Idler pulley
B. Idler gear
C. Circular form tool
D. Lever, crank or linkage arm
E. Cam
F. Latch



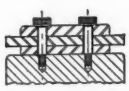
2. Moving Shaft or Pivot

A. Linkage bar connection
B. Cam
C. Cam follower
D. Ratchet
E. Planetary gear or pinion

UNBRAKO SHOULDER SCREWS...
uniform, standardized, precision threaded
industrial fasteners...HAVE NUMEROUS APPLICATIONS

You can use these UNBRAKO Socket Head Shoulder Screws as stationary shafts or pivots, moving shafts or pivots, stationary guides, and for stripper plate and pressure pad applications. These UNBRAKO screws have shoulders held to close tolerances, finished threads close to the shoulder, and threads and heads concentric with the body. Write for descriptive literature. STANDARD PRESSED STEEL Co., Jenkintown 33, Pennsylvania.

UNBRAKO SOCKET SCREW DIVISION

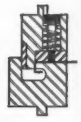


3. Stationary Guide

A. Locating pin in jigs and fixtures
B. Latch stop
C. Alignment of stationary members
D. Linkage block
E. Grooved cam
F. Adjusting block

4. Stripper Plate Uses

A. Blanking dies
B. Compound dies
C. Progressive compound dies
D. Drawing dies
E. Redrawing dies
F. Piercing and shearing dies
G. Combination blanking, drawing and piercing dies
H. Double action blanking and drawing dies



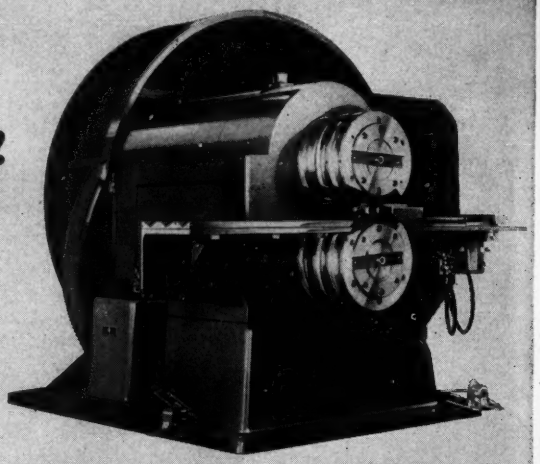
5. Pressure Pad Uses

A. Cutting-off dies
B. Bending dies
C. Bending and forming dies
D. Assembly dies
E. Double action blanking and drawing dies

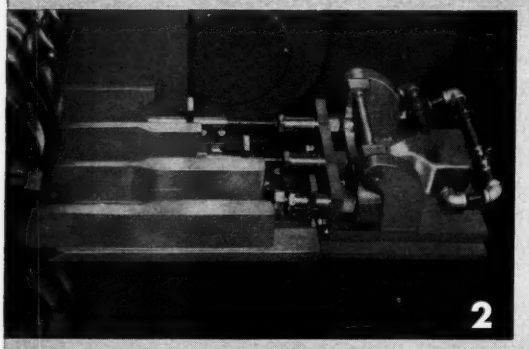
SPS
JENKINTOWN PENNSYLVANIA

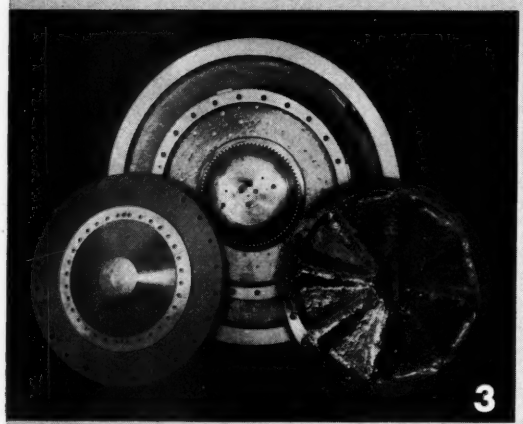
Knurled Head Cap Screw | Self-Locking Set Screw | Flat Head Cap Screw | Shoulder Screw | Dowel Pin

REDUCEROLL your forging blanks!



THE NATIONAL REDUCEROLL • BUILT IN SIX SIZES





REDUCEROLLING — A revolutionary rolling technique that is proving to be a cost-saving short cut to forging blank preparation — is a forge man's dream come true.

Built into National REDUCEROLLS is the ability to produce greater reductions in area than those previously accomplished by rolling. Machine features include:

*** ROLL ASSEMBLY (photo No. 1) Ingenious mounting arrangement assures a tight operating fit and quick roll change.**

*** AUTOMATIC STOCK GAUGE TRIP UNIT (photo No. 2) sets rolls in motion at the instant stock is in place against gauge. Eliminates use of foot treadle, speeds operation, reduces fatigue.**

**** DIAPHRAGM CLUTCH (photo No. 3) is air-cooled and operates with only a single friction plate. This is the same rugged clutch which is compiling unparalleled performance records on the latest National Forging Machines and MAXIPRESSES.**

Let us help you investigate the application of REDUCEROLLING to your forging work. Send us a print or sample of your forging — better yet, pay us a visit. No obligation.

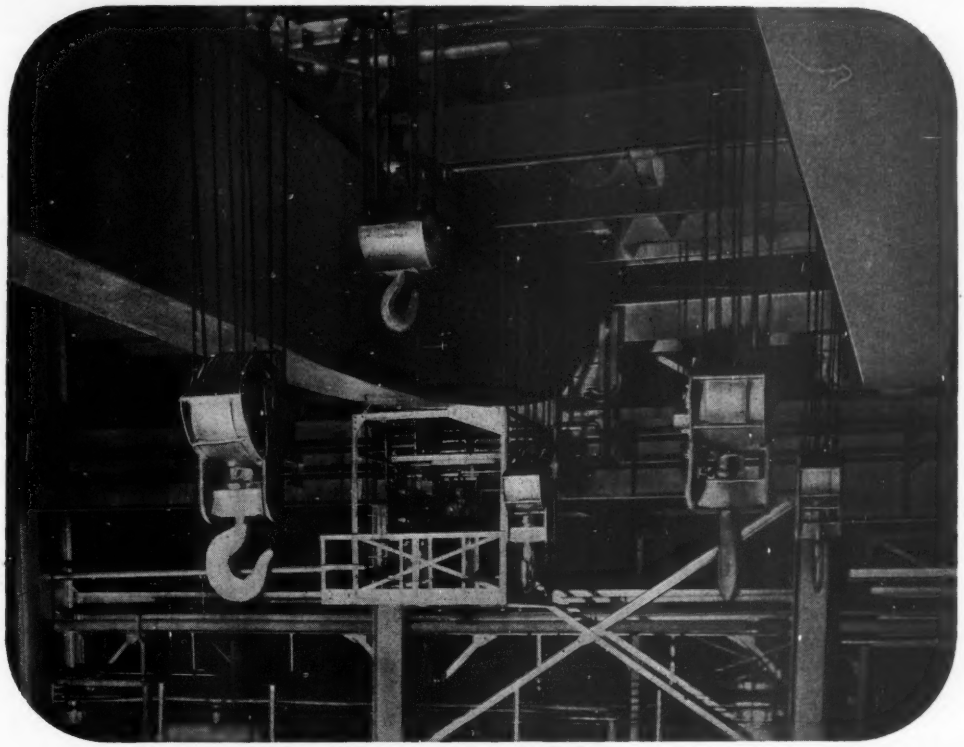
***Patents Applied for** ****Patented**

NATIONAL
MACHINERY COMPANY
TIFFIN, OHIO — SINCE 1874

DESIGNERS AND BUILDERS OF MODERN FORGING MACHINES • MAXIPRESSES • REDUCEROLLS • COLD HEADERS • BOLTMAKERS • NUT FORMERS • TAPPERS • NAILMAKERS

Hartford Detroit Chicago

WIRE ROPE



This is the most economical rope we've ever made for industry

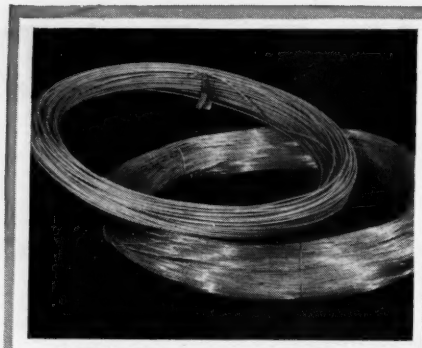
ROEBLING is the best known name in wire rope. That's partly because we were the first wire rope makers in America. But more than that, we've always led in developing better wire and better rope for every purpose.

Today's Roebling Preformed "Blue Center" Steel Wire Rope is the plant man's best choice for efficiency and long life. This rope has *extra* resistance to crushing and abrasion... stands up under rough going. It saves you time and cuts costs.

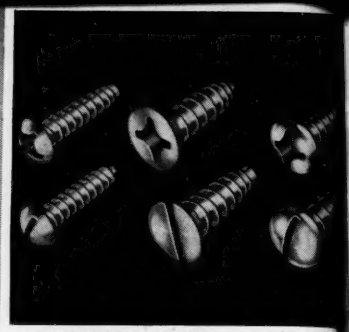
There's a Roebling wire rope of the right specification for top service on any job. Call on your Roebling Field Man for his recommendations. John A. Roebling's Sons Company, Trenton 2, N. J.

ROEBLING

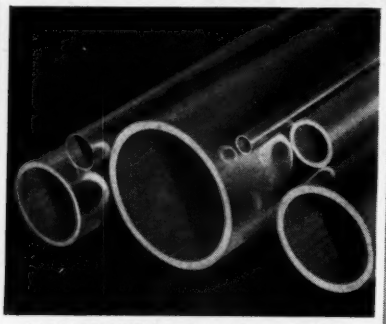
ATLANTA, 934 AVON AVE • BOSTON, 51 SLEEPER ST • CHICAGO, 5525 W. ROOSEVELT RD • CINCINNATI, 3393 FREDONIA AVE • CLEVELAND, 701 ST. CLAIR AVE, N. E. • DENVER, 4801 JACKSON ST • DETROIT, 915 FISHER BLDG • HOUSTON, 6216 NAVIGATION BLVD • LOS ANGELES, 5340 HARBOR ST • NEW YORK, 19 RECTOR ST • ODESSA, TEXAS, 1920 E. 2ND ST • PHILADELPHIA, 230 VINE ST • SAN FRANCISCO, 1740 17TH ST • SEATTLE, 900 1ST AVE S. • TULSA, 321 N. CHEYENNE ST • EXPORT SALES OFFICE, TRENTON 2, N. J.



WIRE—Coiled and straight lengths; rivet wire; flattened and slit wire.

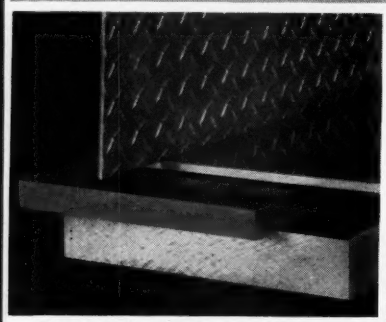


FASTENERS—Machine screws, wo screws, washers, nuts, bolts, rivets.

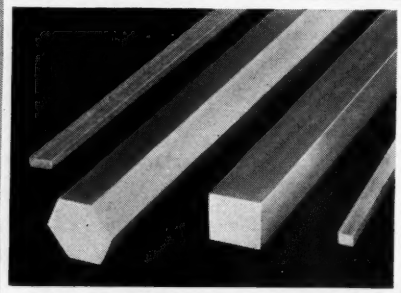


TUBE AND PIPE—Coiled tube; straight tube in round, square and rectangular shapes; heat exchanger tubes; standard pipe and pipe fittings; irrigation pipe; rigid conduit.

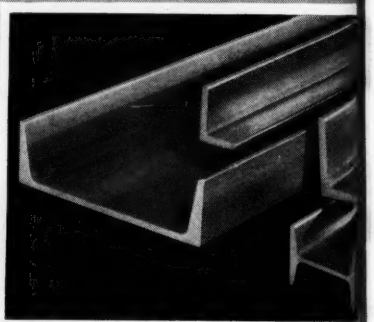
These are the MILL PRODUCTS *of* ALCOA



SHEET AND PLATE—Flat and coiled sheet; circles; patterned sheet; tread plate; roofing and siding sheet; roofing accessories and fasteners; specialty sheet.



BAR STOCK—Square, hexagonal and rectangular bar stock in free-cutting and higher-strength alloys.



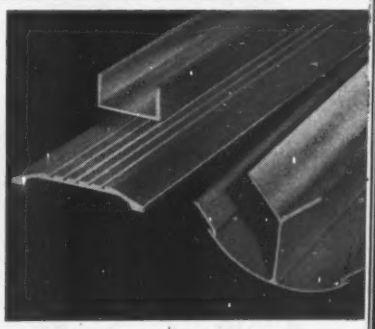
ROLLED SHAPES—Equal angles; unequal angles; channels; I-beams; H-beams; Tees; Zees.

NOW 6:30 P.M. EDST every Sunday —"SEE IT NOW" with Edward R. Murrow . . . brings the world to your armchair . . . CBS Television

ALUMINUM COMPANY OF AMERICA

SCREW MACHINE STOCK—All free-cutting alloys plus the higher-strength alloys—24S, 61S and 75S.

WELDING AND SOLDERING SUPPLIES—Welding and brazing wire, welding and brazing flux, solder flux, solder.



EXTRUDED SHAPES—Miscellaneous extruded shapes such as angles, channels, half rounds, quarter rounds, thresholds, truck corners, structural members, etc. Round, square and rectangular bars.

They have these 12 basic advantages and scores of others

- Light Weight
- High Resistance to Corrosion
- High Electrical Conductivity
- High Conductivity for Heat
- High Reflectivity for Light and Radiant Heat
- Workability
- Non-Toxic
- Strength in Alloys
- Non-Sparking
- Non-Magnetic
- Appearance
- High Scrap and Re-Use Value

They are available from your local ALCOA sales office, distributor or jobber subject to government regulations

For help in interpreting government regulations and all possible co-operation in filling your rated orders, call on your local Alcoa sales office, distributor or jobber. You'll find them listed under "Aluminum" in your classified phone book.

With them goes the skill in fabricating, assembly and finishing of 64 years of aluminum knowledge

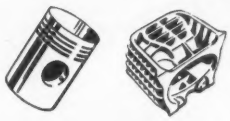
This know-how plus the help of the world's greatest aluminum research and testing facilities is available to you through your local Alcoa sales office.

There are no restrictions on the aid and know-how that go with them

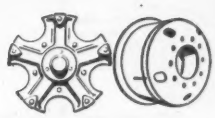
For technical literature and movies to train your personnel, for the personal help of Alcoa sales engineers, for the long-range research and testing of aluminum for your products, call your local Alcoa sales office.

ALUMINUM COMPANY OF AMERICA
1808F Gulf Building • Pittsburgh 19, Pa.

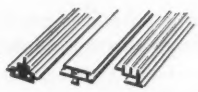
ALCOA ALSO MAKES PRODUCTS TO CUSTOMER SPECIFICATION



CASTINGS
sand, plaster, permanent mold and die



FORGINGS
drop, hammer and press forgings

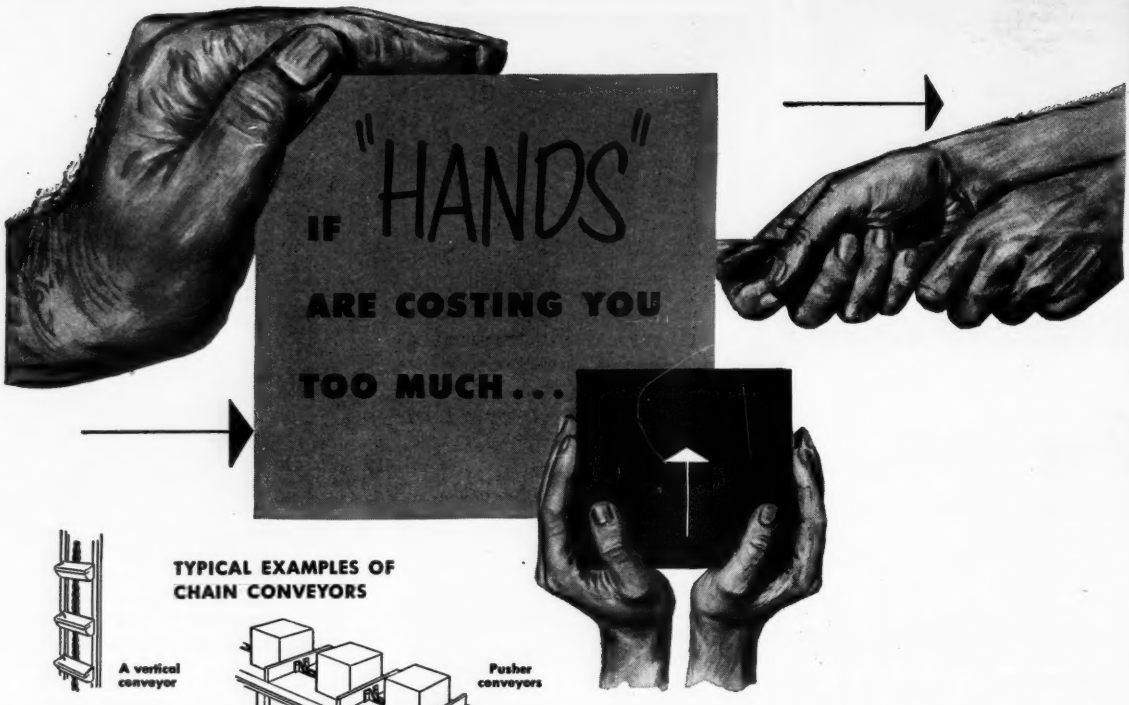


EXTRUDED SHAPES

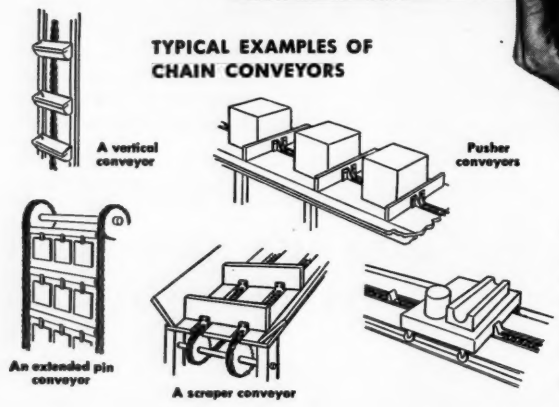
IMPACT EXTRUSIONS

SCREW MACHINE SPECIALTIES
special fasteners and screw machine parts

ALCOA *first in* ALUMINUM



TYPICAL EXAMPLES OF CHAIN CONVEYORS



No matter how modern your production equipment may be, old-fashioned hand "push-pull-carry" methods of moving materials can keep your operating costs high!

To obtain all the benefits of mechanized production, take the "hand" out of handling with Rex and Baldwin-Rex Chain Conveyors. These efficient materials movers can help you increase production, lower costs, raise profits, better working conditions.

Chain conveyors offer you many advantages. They can run in any direction . . . horizontally, vertically, up and down inclines. They can operate at floor level or at any desired working height. They can carry virtually any type of product through practically every production stage faster . . . at far lower costs than manual handling. They can pace your production operations . . . assure a steady flow of material for the production or processing lines. And, because of this, they eliminate the need for stock piles at machines . . . eliminate costly "waiting time" at the operator level.

Chain conveyors eliminate need for wide aisles . . . assure most effective use of floor space. They eliminate need for storage space, high maintenance and service costs required by other types of handling equipment.

For some helpful suggestions on the use and cost-reduction possibilities of chain conveyors, send for your copy of the informative booklet, "Build Profits by Cutting Handling Costs." Address: Chain Belt Company, 4660 West Greenfield Ave., Milwaukee 1, Wisconsin.

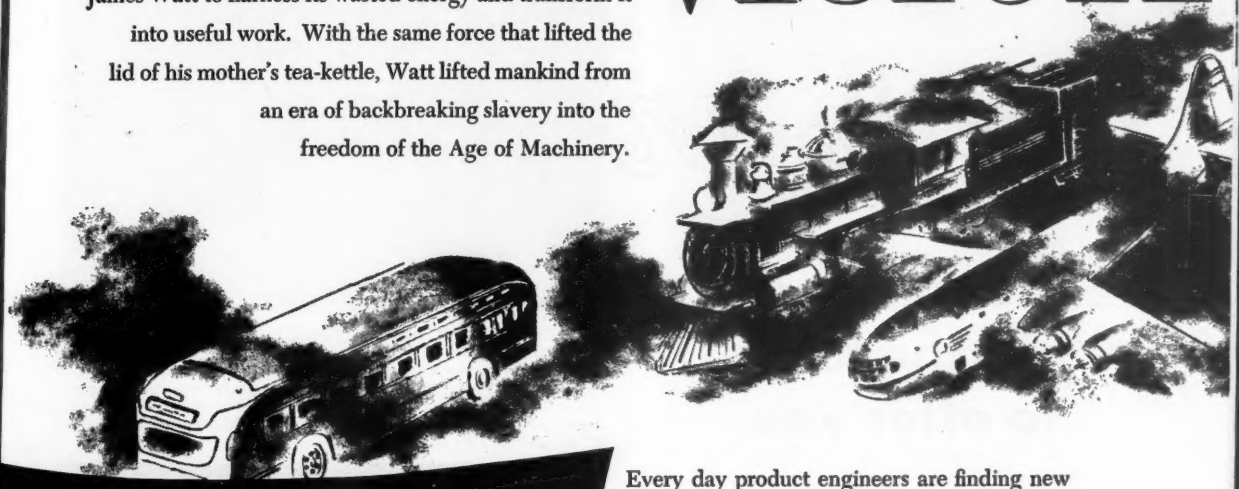
REX
BALDWIN-REX®

Chain Belt COMPANY
OF MILWAUKEE

Atlanta • Birmingham • Boston • Buffalo • Chicago • Cincinnati • Cleveland
Dallas • Denver • Detroit • El Paso • Houston • Indianapolis • Jacksonville
Kansas City • Los Angeles • Louisville • Midland, Texas • Milwaukee • Minneapolis
New York • Philadelphia • Pittsburgh • Portland, Oregon • Springfield,
Mass. • St. Louis • Salt Lake City • San Francisco • Seattle • Tulsa • Worcester

vision

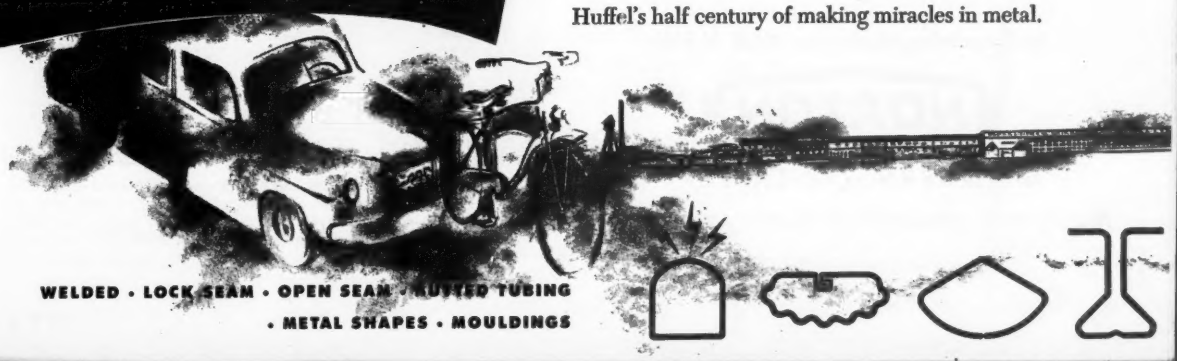
Through centuries of toil, there had been within man's hands the giant Steam, merely awaiting the vision of James Watt to harness its wasted energy and transform it into useful work. With the same force that lifted the lid of his mother's tea-kettle, Watt lifted mankind from an era of backbreaking slavery into the freedom of the Age of Machinery.



Van Huffel

TUBE CORPORATION · WARREN, OHIO

Every day product engineers are finding new applications for Van Huffel cold formed metal shapes and tubing. Whether it's railroads or row-boats—busses or bombers—trailers or trucks—the uses are limited only by the vision of men who plan for tomorrow and capitalize on Van Huffel's half century of making miracles in metal.



WELDED · LOCK SEAM · OPEN SEAM · FLUTED TUBING · METAL SHAPES · MOULDINGS

In grinding . . .

you get the most from Norton

because Norton has the most to offer you

Only Norton offers you such long experience in both grinding wheels and machines to help you produce more at lower costs.

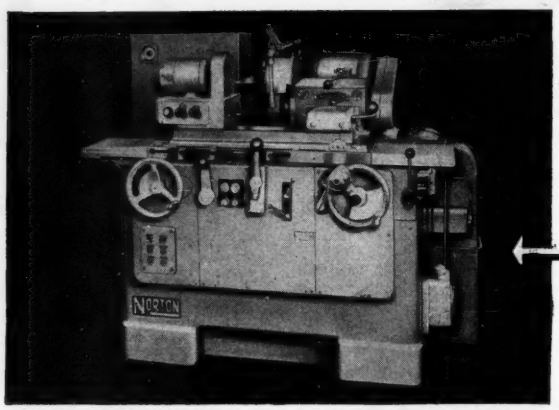
Take advantage of this experience. Discuss with us your present grinding problems or your post-emergency production to fit tentative delivery schedules into your future plans.

***To Economize Modernize With* NEW**

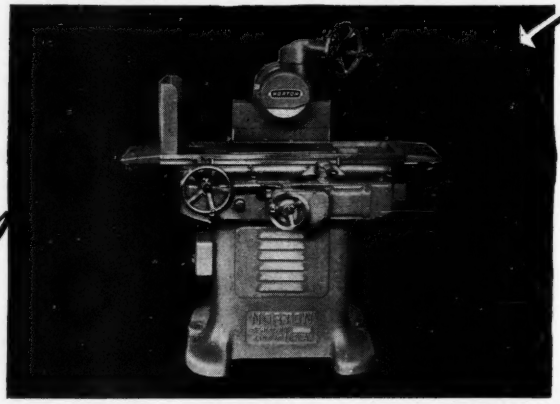
NORTON

GRINDERS *and* LAPPERS

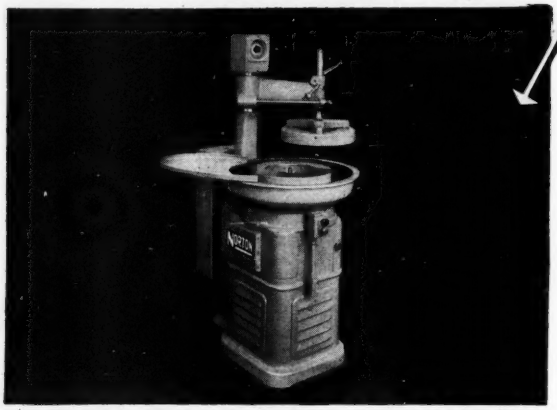
Making better products to make other products better



NEW NORTON 4" TYPE CTU Semiautomatic, in 12" and 18" work-length capacities, rounds out the Norton Cylindrical Grinder Line. Like the larger 6" and 10" CTU's, it offers you a unique combination of speed, accuracy, flexibility and sturdiness. All Norton CTU Semiautomatics have "one lever" control of automatic time cycle which reduces operator attention merely to loading and unloading. *Catalog No. 531* gives you all details.



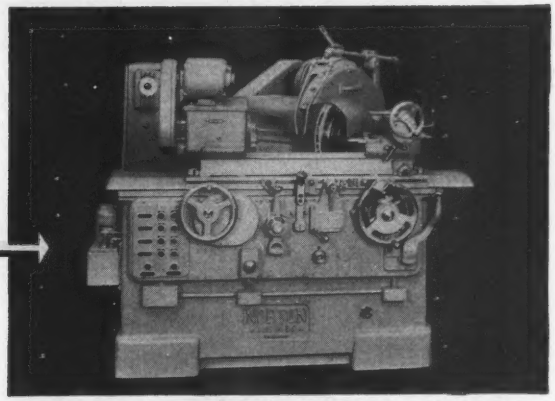
NORTON HYDRAULIC SURFACE GRINDERS, designed with both hand and hydraulic table traverse and cross feed, produce plane surfaces smoothly and speedily. Convenient controls and easy accessibility keep operating and maintenance time low. Such extras as a permanent magnet or direct current type chuck, wet grinding attachment or individual dust exhaust system help make a good basic machine better. Three sizes: 6", 8", and 10". *Write for Catalogs 954 (6"); 190 (8") and 1745 (10").*



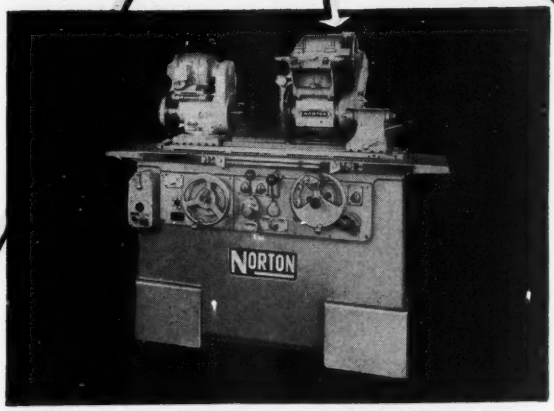
NORTON TYPE 16FC VERTICAL LAPPER produces either flat or cylindrical work to a high degree of dimensional accuracy, parallelism and finish. Widely used for such work as diesel injector parts, plug gages, size blocks, sides of small bearing races, pump gears and plates and other parts. Other Norton lappers are available. *Write for Catalog 212 and General Catalog 1843.*

Norton Grinders and Lappers

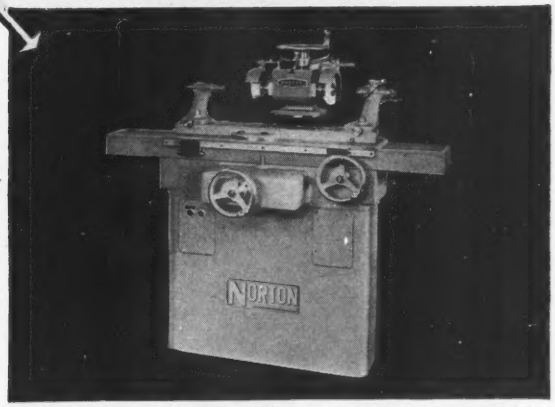
The world's most complete line



NORTON ANGULAR WHEELSLIDE GRINDERS are semiautomatic machines which simultaneously grind thrust surfaces and adjacent diameters to finest accuracy and finish. By eliminating the need for an extra operation, they cut over-all production costs. "One lever" control of automatic time cycle, as in CTU's, helps operators produce more with less effort. Two sizes: 6"x18" and 10"x36". *Catalogs No. 533 (6"x18") and 1793 (10"x36")* give you more information.



NORTON UNIVERSAL GRINDERS are so flexible they handle almost an endless variety of jobs. Compound swivel arrangement allows you to set and feed the wheel at any angle. External, internal, face or angular wheelslide operations come easy with Norton Universal Grinders. Four sizes: 10"x20" and 12", 14", or 16", each with work length capacities of 36", 48", or 72". *Write for Catalogs 170 (10"x20") and 1668 (12", 14", 16").*



NORTON NO. 20 CUTTER AND TOOL GRINDER, with its tilting wheel head, is the most versatile machine in its class. Wheel head tilts 15° above or below horizontal . . . may be swivelled 360° in a horizontal plane. Integral motor cartridge type spindle, duplicate controls for front or either-side operation are other features that make this machine first choice for toolroom grinding. *Write for Catalog 189.*

ONLY NORTON OFFERS YOU OVER 50 YEARS OF COMBINED EXPERIENCE IN:

Abrasives and Grinding Wheels

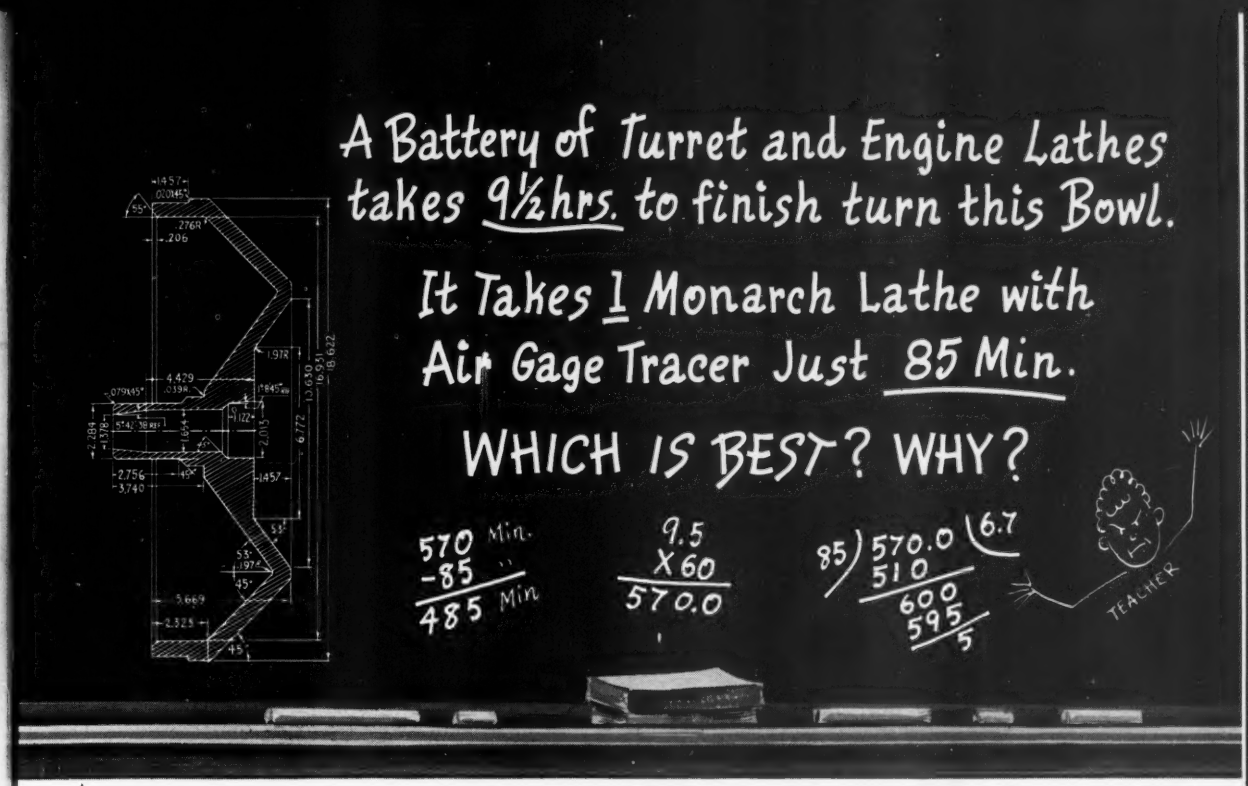
Machines for Cylindrical Grinding • Surface Grinding • Cylindrical and Flat Lapping • Universal Tool and Cutter Grinding • Universal Multipurpose Grinding • Specialized Grinding • Crankshaft Grinding • Cam Shaft and Contour Grinding • Roll Grinding.

NORTON COMPANY • MACHINE DIVISION • WORCESTER 6, MASS.

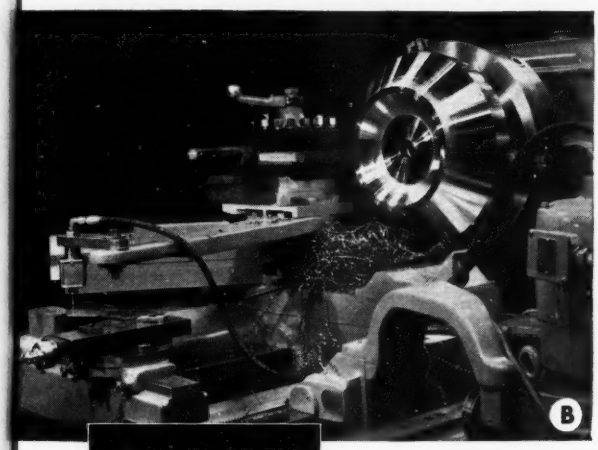
District Sales Offices: Hartford • New York • Cleveland • Chicago • Detroit

In Canada: J. H. Ryder Machinery Co., Ltd., Toronto 5

Most complete service ever offered !
WALLACE BARNES COMPANY
BRISTOL, CONNECTICUT
F. N. MANROSS AND SONS CO.
BRISTOL CONNECTICUT
PLANT
ANN ARBOR MICHIGAN
THE WALLACE BARNES COMPANY LTD.
HAMILTON, ONT. CANADA
You can depend on
DIVISIONS OF ASSOCIATED SPRING CORPORATION



Simple Arithmetic!



STAINLESS STEEL CREAM SEPARATOR BOWL JOB REPORT

MATERIAL—Rough-turned stainless steel forging. EQUIPMENT—Monarch 25" Model N Heavy Duty Lathe with Swiveling Air Gage Tracer. OPERATIONS—1. Turn O.D. Turn hub and face to reverse taper (2-section template). 2. Change template—face rim and turn reverse taper (Figure A). 3. Turn work, change template—rough inside taper, finish turn complete, bore (Figure B). Same 2-section template used for all three cuts.

HOW DO YOU EFFECT SAVINGS LIKE THIS? With the Monarch "Air-Gage Tracer" PLUS, in this case, the exclusive swiveling design. For efficient cutting tool action on a wide range of planes during a continuous cut, there's nothing else like it. Even including work-handling time, floor to floor time of 85 minutes is easily maintained. This is due to the automatic accuracy of template contour duplication . . . ease of set-up . . . simplicity of tooling and tool change.

HAVE YOU TURNING OPERATIONS THAT YOU'D LIKE SIMPLIFIED? Monarch Lathes range from the 10" Model EE Precision Lathe to 32" Heavy Duty Turning Machines—most of which we can provide with any one of our *three* types of Tracer Controls. *You* know the kind of guts and accuracy we build into Monarch Lathes. Let us show you what they can do with Tracer Controls. Just detail your job . . . . *The Monarch Machine Tool Company, Sidney, Ohio.*

Monarch
ACCURACY • ECONOMY • LONG LIFE
TURNING MACHINES

FOR A GOOD TURN FASTER...TURN TO MONARCH

BRIDGEPORT BRASS COMPANY

COPPER ALLOY BULLETIN

"Bridgeport" MILLS IN BRIDGEPORT, CONN. AND INDIANAPOLIS, IND.—IN CANADA: NORANDA COPPER AND BRASS LIMITED, MONTREAL

Brass and silicon bronze screw products made by cold heading and roll threading.
Courtesy Connecticut Screw & Rivet Co., Inc., Waterbury, Connecticut.

Cold Heading and Roll Threading for Economical Production

If you can make a screw product by cold heading and roll threading, you benefit twofold — low cost operation and the economy of no waste of material during fabrication.

Screw wire in brass or silicon bronze is specially processed. It should not be too soft or the shank of the screw or rivet will not be stiff and strong. In addition, the wire must be smooth and clean, free from blemishes, folds, blisters and scratches which may result in spoilage.

To obtain these special characteristics, the wire must generally be cold drawn to the required temper yet it must retain sufficient ductility to flow readily and fill the die completely without developing dangerous strains and stresses. For heads that are large and thin, a somewhat softer or a more ductile wire may be called for.

Cold working, both heading and roll threading, of course, hardens the metal considerably but generally limits further cold working operations except in the case of silicon bronze (Bridgeport's Alloy No. 609), which does not work-harden as rapidly as brass. This is illustrated by the silicon bronze stud, above. The serations on the outside of the head were made during heading when the metal filled the die.

The processing of screw wire in Bridgeport mills is done under strict laboratory control with careful inspection and testing because uniformity of temper is most essential for material which has to undergo automatic operations.

We list here the most popular screw wire. A wider range of alloys are dealt with in the Bridgeport "Technical Handbook."

High Brass 16 (approximately 65% copper, 35% zinc). Very ductile and malleable. Most popular of the heading wire alloys. Used for making all types of machine, wood and cap screws, solid and hollow rivets, special fastenings.

70-30 Brass 69 (approximately 70% copper, 30% zinc). Slightly more ductile than high brass wire. Used for making exceptionally large heads and certain types of hollow rivets.

Commercial Bronze 25 (approximately 90% copper, remainder zinc). Bronze color, resists season cracking. Recommended for outdoor construction.

Silicon Bronze 609 (approximately 98% copper, 2% silicon). Exceptionally malleable even in its hard drawn condition. Excellent for making all types of screw products by cold upsetting and roll threading. Fine for outdoor construction where brass and steel are not satisfactory.

For your brass and bronze requirements or help on your metal problems, please contact the nearest Bridgeport branch office.

SCREW WIRE FOR COLD HEADING

	High Brass 16	70-30 Brass 69	Coml. Bronze 25	Silicon Bronze 609
ANALYSIS				
Copper %	65.0	70.0	90.0	98.0
Zinc %	35.0	30.0	10.0	
Silicon %				2.0
MECHANICAL PROPERTIES				
Ten. Strength psi { Hard*	65,000	65,000	50,000	80,000
Ten. Strength psi { Soft	50,000	50,000	40,000	45,000
Elongation, % in 2" { Hard*	25	25	13	12
Elongation, % in 2" { Soft	60	60	50	50
PHYSICAL CONSTANTS				
Melting Pt. (Liq) °F	1710	1750	1910	1940
Density, lbs./cu. in.	.306	.308	.318	.316
Coeff. Ther. Exp./°F 77°F to 572°F x 10^{-6}	11.3	11.1	10.2	9.8
Thermal Conduct. Btu/sq. ft/ft/hr/°F@ 68°F	67	70	109	27
Elec. Cond. %IACS @ 68°F Soft	27	28	44	9
Mod. of Elas. (Tension). psi	15,000,000	16,000,000	17,000,000	17,000,000
FABRICATION PROPERTIES				
Machinability Rating**	30	30	20	30
Cold Working	E	E	E	E
Hot Working	P	F	G	E
Hot Working Range, °F		1350—1550	1400—1600	1300—1600
SPECIFICATIONS				
A. S. T. M.	B134 Alloy #7	B134 Alloy #6	B134 Alloy #2	B98 type B B99 type B
Federal	QQ-W-321 Gr. A	QQ-W-321b Gr. C		QQ-C-591a Class B
Army			JAN-G-383 57-171	
AMS	4713			
SAE	80B			

*Hard temper values are for wire of commercial hard drawn temper suitable for cold heading. **Machinability Rating—Free Cutting brass—100.
E—Excellent G—Good F—Fair P—Poor (8492)

CAUSES OF CORROSION

This article is one of a series of discussions by C. L. Bulow, corrosion metallurgist of the Bridgeport Brass Company.

DEZINCIFICATION CORROSION (Cont'd)

Discussion on Welded or Brazed Joints

The importance of using the correct metal for joining metal parts by brazing and welding cannot be overemphasized. Brazing and welding alloys should be carefully selected where a corrosive environment is likely to be encountered in service in order to prevent failure of the joint through dezincification.

The brazing alloys which contain about 60% copper and 36-38% zinc together with small amounts of manganese, iron, tin, or silicon, etc., are easy to use in the joining of various metals by brazing and result in joints of high strength which give excellent service in many environments.

Brazing Iron and Steel

The brazing alloys which are known as naval brass, manganese and low-fuming bronzes, are widely used for joining steel and cast iron with very satisfactory results. In a good electrolyte such as sea water, the narrow wedge or band of copper brazing alloy is galvanically protected by the much larger surface of the ferrous metal without the latter showing any significant increase in corrosion.

Welding Copper Alloys

Welded joints composed of low copper (high zinc) brazing alloys have been subject to rapid dezincification in fresh and saline waters. Even joints made by welding arsenical Admiralty with uninhibited Admiralty welding rod have suffered from the dezincification localized in the narrow band of welding alloy.

Such localized dezincification can be avoided either by welding arsenical Admiralty with arsenical Admiralty welding rod, with silicon bronze welding rod (about 98% copper, 2% silicon), or with a suitable silver brazing alloy.

Copper and high copper alloys (usually over 85% copper) for use in environments conducive to weakening by dezincification of a low copper brazing alloy or Spelter solder (50% zinc, 50% copper) should be welded either with welding rod of identical composition or with silicon bronze or with a silver brazing alloy.

Braze Welding for Reducing Down-Time

Management is focussing its attention on maintenance because of its vital importance in keeping production flowing. Shutdowns are much more costly than the labor or materials involved in making the repairs. The important factor is to put the machine or equipment back into service with the utmost dispatch.

This explains why braze welding is fast replacing other methods for joining broken cast iron and steel parts since such repairs can be made without the necessity of preheating the entire casting and slow cooling after the weld is made.

The melting temperature of the bronze welding rod is considerably lower than that of the iron or steel. After cleaning and proper preparation, the break is heated only to redness. The free flowing bronze rod "tins" and fills quickly and smoothly giving a clean, uniform non-porous deposit with a very high tensile strength and good shock resistance.

Write for "Bronze Welding Alloys," a 24-page booklet, which contains detailed information on brazing and welding and the various bronze welding alloys that are available.

NEW DEVELOPMENTS

This column lists items manufactured or developed by many different sources. None of these items has been tested or is endorsed by the Bridgeport Brass Company. We will gladly refer readers to the manufacturer or other sources for further information.

Barrel Burnishing Powder is said to impart excellent color and finish to copper, brass, bronze and copper alloy stampings and castings that can be tumbled. Can be used with coated abrasives, quarried stones, steel balls or other burnishing media. Parts are said to leave barrel free from chips, sludge, or other foreign matter. **No. 1236**

Infrared Oven, said to facilitate drying of electroplated parts and baking of synthetic enamels and finishes on small parts, has roller tray equipped with ball bearing steel wheels. Standard oven lengths are 24, 32, 48 and 96 in., and oven size can be increased by additional sections. Oven types range from shallow types for small parts to tall designs for baking 18-in. high parts. Tray will support 50 lbs. **No. 1237**

Precision Surface Grinder is said to convert easily to milling machine. With extra heavy head stock, micrometer dials, and ball bearing-mounted spindle, machine mounts a 4-in. diam. wheel and is equipped with a small magnetic chuck. Attachments convert grinder for milling operations. Claimed speeds are up to 7,000 rpm. Table surface is 9½ x 6 in. **No. 1238**

Twisted Wire Brushes in 58 standardized sizes are said to be made of special abrasion resistant wire of high tensile strength for hand or power use. Size ranges in increments of 1/32 in. from ⅛ to 1-in. diameter in single spiral type, from ¼ to 1-in. in double spiral design. **No. 1239**

Hand Pyrometer is said to measure surface, liquid, gas and molten metal temperatures easily. Has two scale ranges of 0-500 and 0-1500° F. Changeover is made by a flick of a switch. Three interchangeable tips include surface, immersion and two-prong contact types, as well as rigid and flexible extension arms are claimed to be quickly changeable. Pyrometer and accessories have handy carrying case. **No. 1240**

BRASS, BRONZE, COPPER, DURONZE, NICKEL SILVER, CUPRO NICKEL

"Bridgeport" BRASS CO.

BRIDGEPORT BRASS

BRIDGEPORT BRASS COMPANY, BRIDGEPORT 2, CONN. • ESTABLISHED 1865

Mills at Bridgeport, Connecticut, and Indianapolis, Indiana • In Canada: Noranda Copper and Brass Limited, Montreal

Warehouse Service with Slitting Facilities in Principal Cities

Advertisement

Secret of a split-second click!

SET your camera for the split-second timing you want. Flick the exposure lever. Click! That's it!

A tiny spring of music wire, as small as .006" in diameter, makes this possible. It momentarily stores the power of your flick, then releases this power, precisely controlled, to click the shutter. Chances are your own camera has a shutter spring much like one of those shown above. Chances are, too, that it is formed of wire from National-Standard's Worcester Wire Works Division, for here special music wire is produced continually for America's leading camera makers.

Camera makers are particular people. To give you equipment with lifetime reliability, to give you *good* pictures, even the wire for such tiny springs must be the finest of its kind . . . a job for experts. Imagine the painstaking care, the highly developed techniques necessary to produce this fine wire with its essential uniformity, high tensile strength, temper and perfect finish.

Music wire in its various types and sizes has an infinite number of uses, but is only one of many special kinds of wire produced at Worcester Wire Works. If *you* have a need for special-purpose wire, Worcester Wire Works specialists, as always, welcome the chance to show you what cooperation really means.

NS
NATIONAL-STANDARD Company
NILES, MICHIGAN

DIVISIONS OF NATIONAL-STANDARD CO.

ATHENIA STEEL	*Clifton, N. J.*	**Flat, High Carbon, Cold Rolled Spring Steel**
NATIONAL-STANDARD	*Niles, Mich.*	**Tire Wire, Stainless, Fabricated Braids and Tape**
REYNOLDS WIRE	*Dixon, Illinois*	**Industrial Wire Cloth**
WAGNER LITHO MACHINERY	*Jersey City, N. J.*	**Metal Decorating Equipment**
WORCESTER WIRE WORKS	*Worcester, Mass.*	**Round and Shaped Steel Wire, Small Sizes**

Look around your office

for Metalworking products...

...made in the plants reached by STEEL

Ever notice within the four walls of your office, how many Metalworking products surround you? Yet these products represent only a small segment of the huge metalworking industry which made them—a fast-growing market that has doubled in size over the past ten years. This is the market reached by STEEL—the only metalworking magazine which has grown as rapidly as the dynamic industry it serves. To help your company keep pace with metalworking's growth —and ahead of your competition—invest your advertising dollars in the magazine that's growing with your market.

STEEL • Penton Building • Cleveland 13, Ohio

Making an Adding Machine calls for many of the operations performed in the processing of all metalworking products—operations common to all branches of the metalworking industry. To sell more to Metalworking you must reach the men responsible for these operations. Your advertisement in STEEL reaches more of these key men than in any other metalworking magazine.

The magazine of the men who manage, operate, and buy for the metalworking industry

NOTE: Our stocks also include nickel-bearing stainless in a wide range of types for quick shipment subject to NPA controls.

Life-saver for Users of Stainless Steel

Straight Chrome Stainless For Quick Shipment from Ryerson

If you are among those handicapped by government restrictions on nickel-bearing 18-8 stainless, large Ryerson stocks of straight chrome stainless may prove to be a life-saver. For example, many who formerly used type 302 sheets to meet mild corrosive action are finding a practical alternate in type 430. And this 17% chrome stainless is on hand now —ready for immediate delivery from your nearby Ryerson plant.

You can order type 430 sheets from Ryerson in all gauges from 10 to 26, in No. 2B or No. 4 finish—and in almost any quantity. You can also get quick shipment of these additional straight-chrome products: type 405 sheets—types 410 and 430 plates—and type 416 bars. It all adds up to the nation's largest stock of straight-chrome stainless. All with no restrictions on end use, but all time-tested Allegheny stainless of uniform high quality and definitely established characteristics.

In this stock, you may well find a steel that will enable you to maintain satisfactory quality in your product until nickel-bearing steels are again available. So now for stainless, we urge you to consider the versatile chromium stainless steels in Ryerson stock.

RYERSON CERTIFIED STEELS

WRITE FOR HELPFUL DATA—*On Type 430 and Other Chrome Stainless*

To help you convert to chrome stainless, we shall be glad to send an authoritative bulletin on the mechanical properties, corrosion resistance, weldability, etc., of these steels as compared with 18-8 stainless. Write for your copy. And remember that the advice of Ryerson stainless specialists is always yours for the asking. We suggest you discuss your chrome stainless problems with us.

National Warehouse Distributor of Allegheny Stainless in All Types, Shapes and Sizes

RYERSON STEEL

JOSEPH T. RYERSON & SON, INC. PLANTS AT: NEW YORK • BOSTON • PHILADELPHIA • CINCINNATI • CLEVELAND • DETROIT
PITTSBURGH • BUFFALO • CHICAGO • MILWAUKEE • ST. LOUIS • LOS ANGELES • SAN FRANCISCO • SPOKANE • SEATTLE

METALWO OUTLOOK

June 23, 1952

Secret Steelworker Poll?

Pressure is rising for a secret poll of the steelworkers on the last offer by the companies, of 22 cents. Pennsylvania congressmen want it. Some steel companies, who are sending out mailings to their employees explaining their offer, think the proposition would be accepted in a secret vote. The largest union local, the 11,000-member No. 1397 at U.S. Steel Co.'s Homestead Works, made a public statement that sounded like it wanted a compromise on the union shop issue. Mr. Murray's headquarters promptly said that the "statement is subject to misinterpretations" and that the Homestead local is "solidly behind" the international's demands. John L. Lewis' offer of a loan to the steelworkers was nicely timed to bolster labor spirits just as some of the members were faltering.

Limited Help

The emergency action thus far worked out by NPA to help military contractors get steel (p. 49) sets up a super priority. Its benefits are limited by the fact that the CMP rules prevent the extension of this rating past the first tier of "B" product manufacturers. While the priority might be used to buy a generator, the generator manufacturer could not use the priority to purchase the components which he might need.

Victory Over Paperwork

If they do nothing else, the sweeping relaxations of aluminum and copper orders (p. 49) to permit greater self-certification will eliminate a lot of paper work. As many as 25,000 users of the two metals may be freed from the necessity of filing, leaving less than 5000 large users of the metals still under direct controls. The effect on materials distribution of the amended orders and of the 100-million-pound bonus in copper for the third quarter (pp. 45 and 157) may not be as good as expected if the steel strike isn't settled soon. In many cases, aluminum and copper are used in conjunction with steel; a lack of steel may force a curtailment of some project, so the additional aluminum and copper available would be of little help.

More Bauxite by 1953

Facilities to produce bauxite, the raw material from which aluminum is made, will be expanded to produce 8 million long dry tons by the end of 1953, 3.3 million tons above the 1951 supply. The expansion will occur in Jamaica, Haiti and Santa Domingo.

Expansion Lid Tightened

The government is clamping down more on industrial expansions. A new ruling states that no more individual expansions requiring

Production-Engineering News—p. 71 *The Market Outlook—p. 145*

tax amortization will be considered by Washington without prior consultation with the government. The bulk of all industrial expansions have already been completed, started or at least approved for starting, so the new move won't have any serious effect on the nation's capital expansion program.

Because of Freight Rates

Watch for eventual action by the big steel companies with plants in many parts of the country to make a greater variety of products at each mill. The reason: Freight rates. The present system of specialization at each plant has put some of the big companies at a freight disadvantage in various areas. They figure that by diversifying their plants' production more they can get lower freight rates and meet more competition.

Surplus of Surplus Areas

Protests mount at Defense Manpower Policy No. 4, the one that sets up labor surplus areas which are given preference in getting defense contracts. Small business men are the most vocal against the policy. They claim the preference offered merely transfers the conditions in one community to another. There now are 40 labor surplus areas.

Small Firms Take Stock

A useful survey of small plants across the nation is making headway. Proposed by Small Defense Plants Administration, it would make use of state records and enlist state governments' help. Thus far, 26 states say they'll co-operate . . . Some 3500 small manufacturing firms have open capacity for defense work. Bulk of them are in New York, Illinois, Ohio, Pennsylvania and California.

Straws in the Wind

Aside from boosts in membership and income, Mr. Murray wants the union shop so that he can easily organize the workers in big new plants coming into operation, such as the Fairless Works . . . New television models coming onto the market are generally bigger in size and lower in price than last year's units . . . Washington planners are considering permitting a limited production of color television sets for consumers . . . AFL electrical workers and a salaried union have accepted a Westinghouse cost-of-living offer that amounts to about a 1 per cent boost in pay; the CIO and independent electrical workers unions have not accepted.

What Industry Is Doing

Most steel users have two-week inventories on hand, but product imbalances are worsening (p. 43) . . . Some struck mills will open to produce steel for the military (p. 43) . . . NPA will soon relax its ban on shipments of unrated machine tools (p. 44) . . . Coal future is bright as new synthetic liquid fuels and critical chemicals develop, (p. 46) . . . Plumbing makers are finding a drought in sales (p. 47) . . . Japan plans a steel plant in India (p. 53) . . . Hopes for decontrol of nickel are waning as the military demands more (p. 55).

UNITED STAMPINGS

from our Pressed Products Plant

The hardening and grinding department of our Pressed Products Plant is annually producing more and more high quality, precision made, hardened and ground washers, spacers, nuts and stampings. With press capacities from 5 to 300 ton and a large diversified stock of steel on hand, we can service any size of order.

—when you think of fasteners think of United

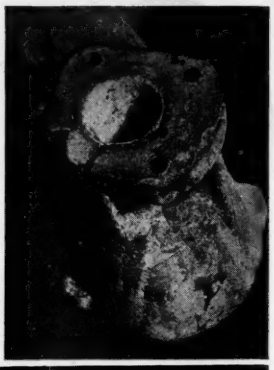
SCREWS · NUTS · WASHERS
CLUTCH HEAD SCREWS
STAMPINGS

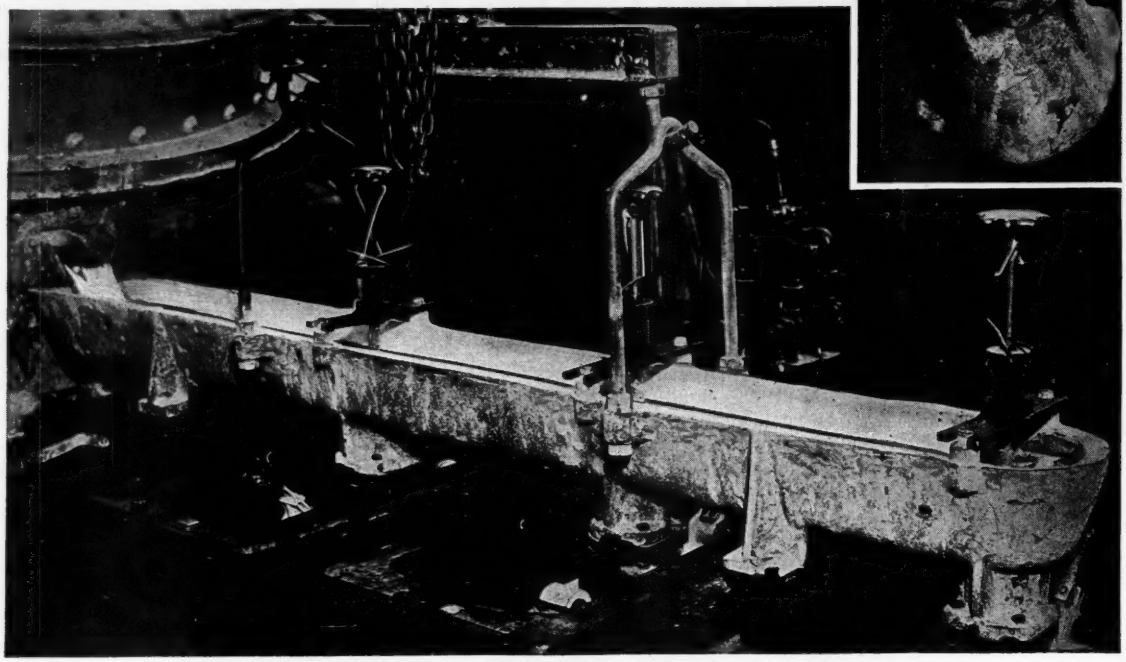
United Screw and Bolt Corporation

Chicago 8 Cleveland 2 NewYork 7

DUCTILE IRON TROUGH . . . channeling molten aluminum from ladle to multiple casting unit. Pouring temperatures vary from 1250° to 1400° F., and average about 1300° F.

BEFORE UTILIZING DUCTILE IRON . . . trough failures usually occurred at down spouts, progressively cracking through flanges. Flanges also warped, throwing bolt holes out of line.





DUCTILE IRON TROUGHS
HANDLING MOLTEN ALUMINUM
Last 6 times longer!

DUCTILE IRON RESISTS OXIDATION AND GROWTH to an extent never before available in gray iron castings...

The photograph above shows one of two Ductile Iron pouring troughs that have been giving virtually continuous service for more than 18 months... five days a week, 24 hours a day... in the Aluminum Company of America plant at Edgewater, N. J. In contrast, the formerly used gray iron troughs had an average life of only three months.

27,000,000 pounds of molten aluminum have been poured with the two Ductile Iron troughs produced by Sacks-Barlow Foundries of Newark, N. J.

Ductile Iron is being used extensively at elevated temperatures, because of its exceptional resistance to oxidation and heat effects. The rapidly growing list of applications include: reduction pots, forging furnace door frames, sintering machine grate bars, lifting plates for coil annealing machines, lifter bars in rolling mills, and scores of engine, furnace and other parts subjected to heat.

Request a list of available publications on Ductile Iron... mail the coupon now.

The International Nickel Company, Inc.
Dept. S, 67 Wall Street
New York 5, N. Y.

Please send me a list of publications on: **DUCTILE IRON**

*Name*_____ *Title*_____

*Company*_____

*Address*_____

*City*_____ *State*_____

EMBLEM OF INCO SERVICE

THE INTERNATIONAL NICKEL COMPANY, INC.

67 WALL STREET
NEW YORK 5, N. Y.

Clipping WSB Wings

Current action in Congress indicates clearly that many of its members belatedly are coming around to a view that has been widely held outside of Washington for a long time—namely, that abuse of its authority by the Wage Stabilization Board is largely responsible for the steel strike.

Many senators and representatives now realize that instead of pursuing a policy of stabilizing wages, WSB has been employing its efforts to find ways of increasing wages for certain favored union leaders. Also it has entered into non-economic aspects of disputes. Its recommendation of the union shop led directly to the present critical examination of WSB by Congress.

The extent to which lawmakers have been aroused by the board's indiscretions was revealed last Tuesday when the House Labor Committee voted 16 to 5 in favor of a recommendation to the House that "WSB should be abolished." It is a pity that this recommendation is not likely to be followed. It is likewise lamentable that a parallel move to abolish the Office of Price Stabilization is not likely to succeed at this time.

However, it is almost certain that the wings of WSB will be clipped. As this is being written, the House is debating whether to abolish WSB or to strip it of authority to handle labor disputes. It looks as if the latter policy will be adopted. If so, the present provision for equal representation by union, employers and public will be changed to provide for a board in which the public members outnumber both industry and union members.

Meanwhile, the Senate has passed a bill calling for a tripartite board subject to Senate confirmation and permitting it to settle certain monetary wage disputes if the parties request such action.

House and Senate bills extending WSB probably will go to conference by the time you read this. Each is too mild, but the House version is infinitely preferable. If time permits, urge your representatives in Washington to exert influence to the end that the House provision for stripping WSB of authority in wage disputes shall prevail in conference.

E. C. Shaner

EDITOR-IN-CHIEF

WHY BUSINESSES FAIL: In the June issue of *Dun's Review*, Griffith M. Jones, assistant to the president of Dun & Bradstreet Inc., classifies the causes of failures in all lines of business for the year ended Mar. 31, 1952. During this period, out of 2,493,314 businesses listed

in the United States, 7957 failed. This is at a rate of 0.319 per cent or slightly above 3 per thousand.

Chief cause for failure was incompetence. It accounted for 48.2 per cent of the total. Other causes, in order, were unbalanced experience (experience not well rounded in sales, finance, purchasing and production), 14.3 per cent; lack of managerial experience, 13.5 per cent; lack of experience in the line of business conducted, 12.6 per cent; neglect due to bad habits, poor health, etc., 5.3 per cent; fraud on the part of principals, 3.7 per cent; disaster such as fire, flood or strike, 1.4 per cent; and defense mobilization, 0.1 per cent. Cause of failure in the case of 0.9 per cent of the companies was unknown.

It is significant that where incompetence or improper experience was the major underlying cause for failure, it was evidenced most frequently in inadequate sales. They figured prominently in about half of the failures.

* * *

AID ON CUTTING OILS: Today many plants with defense orders are called upon to machine alloys in which the characteristics of toughness, resistance to heat or other special quality takes precedence over machinability. Experience with these difficult-to-machine materials is being accumulated gradually, but in most plants some of these jobs still present many headaches.

For one thing, they call for special attention to cutting fluids and coolants. Large corporations with numerous plants can afford specialists to prescribe the proper oil for each job, but the majority of companies must rely upon the advice of outside experts. There are over a hundred makers of cutting fluids (p. 72) and most of them have "trouble shooters" whose experience should be able to help solve your machining problem.

* * *

FEEDER FOR HOMELAND: Reports that Japanese interests are considering the building of two 1200-ton blast furnaces in India (p. 53) brings to mind Japan's policy in developing her Manchurian iron and steel properties prior to World War II. Tatsunosuke Takasaki, who was prominent in the Manchurian activity, is said to be the promoter of the proposed venture in India.

In expanding iron and steel activity in Manchuria, particularly at Anshan, the Japanese clung tenaciously to the idea that as far as possible, activity on the Asiatic mainland should be confined to primary or to limited secondary operations. The blast furnaces, open hearths and rolling mills were considered chiefly as suppliers of pig iron, sponge iron and semifinished or finished steel for final processing in the home islands of Japan. It looks very much as if the Indian project is based on the same idea. Japan wants a mainland source of materials for processing and manufacturing at home.

* * *

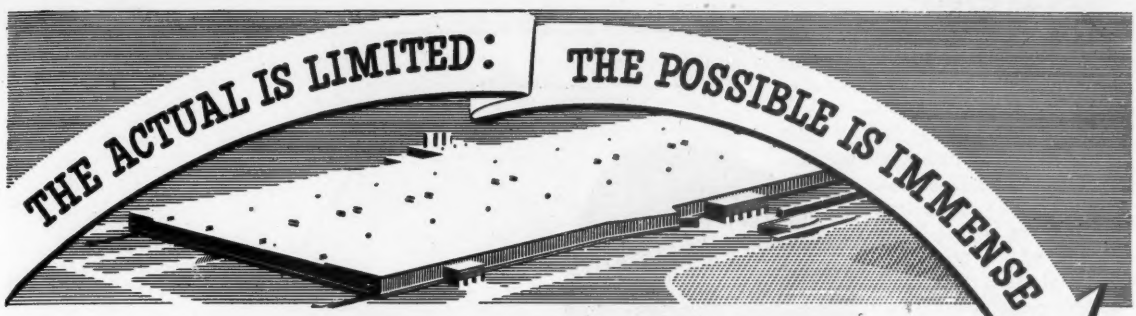
NICKEL REMAINS TIGHT: Recent easing of supplies of steel, aluminum and copper, tends to focus renewed emphasis upon a metal that still presents a serious problem. It is nickel. So pronounced is the margin of demand over supply that experts do not expect equilibrium until 1955.

United States production of nickel is negligible. We produce only 150,000 pounds a month and normally consume 15 or 16 million pounds in that period. Most of the difference comes from Canada. We are allotted 67.9 per cent of the total output of the free world, but it isn't enough. Why? Because some of the new uses of nickel—alloys in jet planes and atomic energy projects—take a disproportionately higher volume of nickel than do our traditional civilian markets for the metal. The nickel situation probably will grow worse before it can get better.

* * *

JUSTICE AT LONG LAST: An unfortunate injustice seems to be in the process of being corrected. For months American machine tool builders, swamped with priority orders and bound by oppressive government restrictive regulations, have had to watch helplessly while European builders—many of them aided by the tax money of American business—came in and sold their machines at lower prices and on prompt delivery to buyers having no credentials of priority.

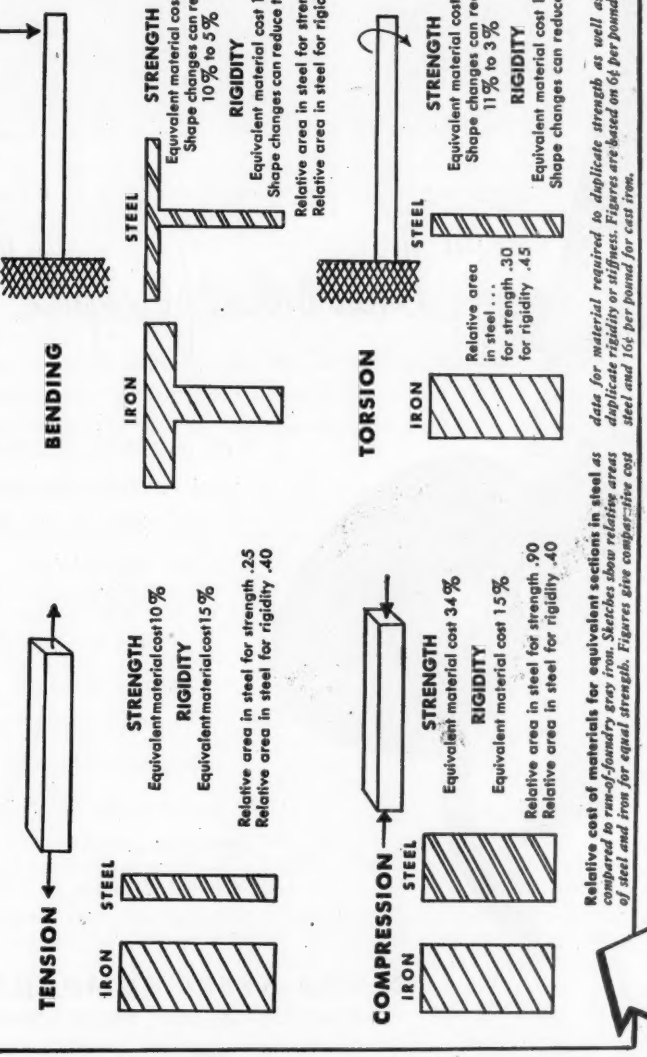
Last Tuesday machine tool builders asked the National Production Authority to relax regulations so that builders who are able to do so can meet this competition by selling to unrated customers. Apparently NPA recognizes their predicament and an order modifying present restrictions to some extent is said to be on its way.



NEW LINCOLN PLANT CREATED BY INCENTIVE-INSPIRED CO-ACTION IN DEVELOPING POSSIBILITIES IN PRODUCT

© LE Co. 1952.

ANALYSIS GUIDE TO EQUIVALENT SECTIONS IN STEEL FOR CONVERTING PRODUCT DESIGNS

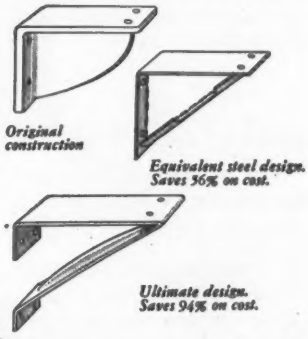


Relative cost of materials for equivalent sections in steel as compared to run-of-foundry gray iron. Sketches show relative areas of steel and iron for equal strength. Figures give comparative cost data for material required to duplicate strength as well as to duplicate rigidity or stiffness. Figures are based on 6¢ per pound for steel and 1½¢ per pound for cast iron.

PROPER DESIGN IN WELDED STEEL IMPROVES PRODUCT AND LOWERS COST

The chart, at left, shows what relative areas in steel will carry similar loads in machine components built of run-of-foundry gray iron. Whenever product designs follow these values, material costs can be cut to 15% simply by substituting the correct amount of steel and without changing shape. Ultimately where the product is correctly shaped to use steel most efficiently, material costs may be reduced to 5% of the casting cost.

The designs below illustrate potential savings on simple machine parts with steel design. Material for the original design weighs 39 pounds, costs $9.10. However, by using the correct amount of steel, the weight is cut to 12 pounds and cost to $3.97. Changing the shape from a solid section to a formed channel cuts the ultimate weight to 9 pounds and material cost to $.58.



Original construction

Equivalent steel design. Saves 56% on cost.

Ultimate design. Saves 94% on cost.

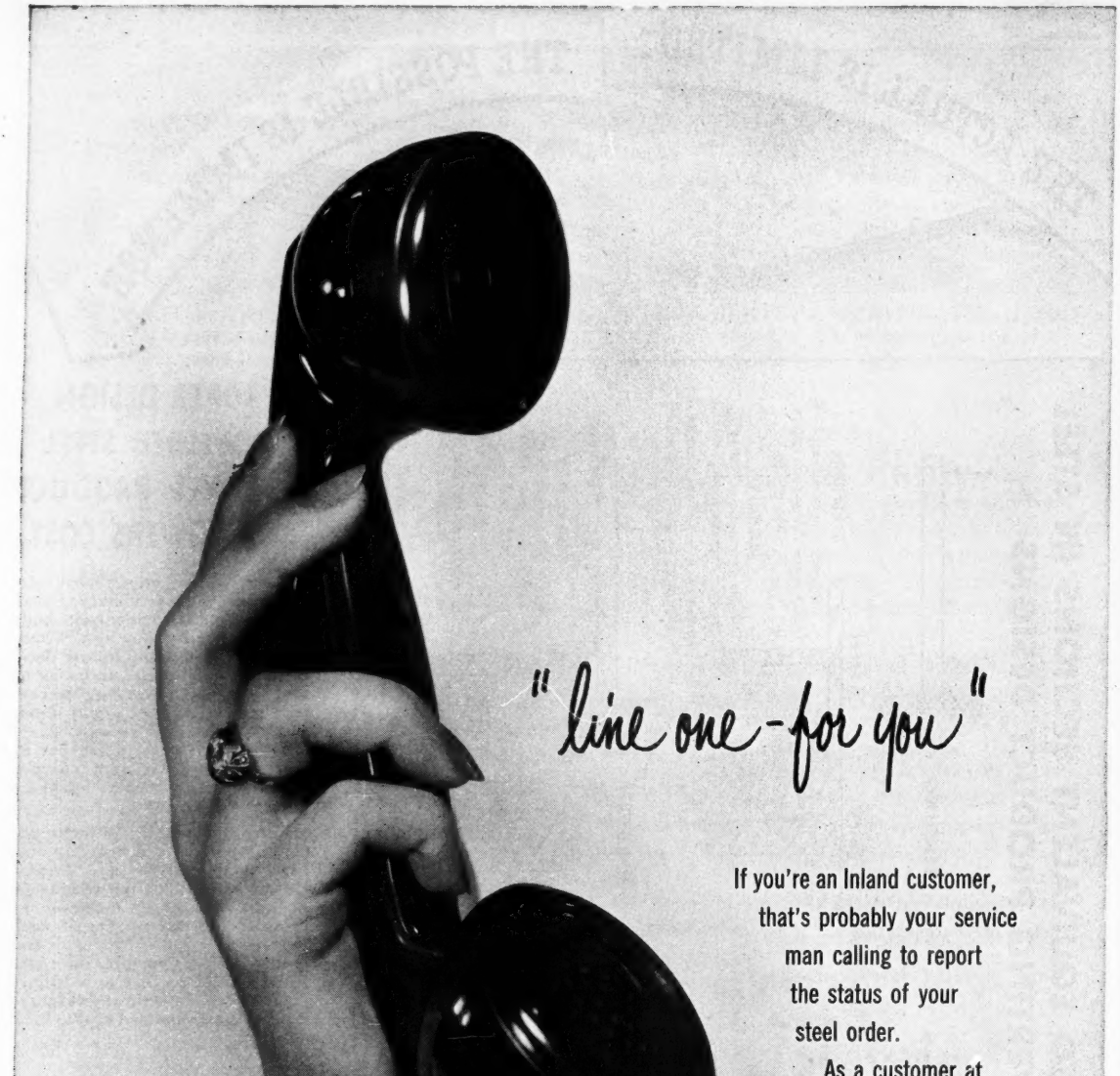
HERE'S HOW

Machine Design Sheets are available on request. Designers and Engineers write on your letterhead to Dept. 67.

THE LINCOLN ELECTRIC COMPANY

CLEVELAND 17, OHIO

The World's Largest Manufacturer of Arc Welding Equipment



"line one - for you"

If you're an Inland customer, that's probably your service man calling to report the status of your steel order.

As a customer at Inland, you have your own service specialist—who expedites your orders and keeps you posted on production progress.

INLAND STEEL COMPANY
38 South Dearborn Street, Chicago 3, Illinois

INLAND

United Press

While ingots like these at U. S. Steel's South Chicago yards lie cold, steel stockpiles continue to dwindle. Processed into usable steel products, they could help extend inventories and correct imbalances threatening metalworking

Steel Stocks: Still Two Weeks

Despite product imbalances, the inventory position is surprisingly good. Hardest hit are volume users of the metal, such as automakers and farm equipment people

STEEL USERS, on the average, still have two weeks' inventories, but product imbalances are worsening.

In the best shape are big equipment builders and tool and die shops who usually order their steel by the job and are pretty well fixed. In the worst shape are big volume users like auto makers and farm equipment people. The area in the best shape appears to be Pittsburgh; in the worst, Detroit.

By-Product — A shortage of sheets in the popular gages is causing the most trouble throughout the nation and contributing to a product imbalance that may cause some early shutdowns before a company has completely exhausted all its steel stocks. Specialty steels are also difficult to get. Heavy plates and large-size bars are scarce. A lack of seamless tubing will close Ford's and Oldsmobile's rocket production lines. International Harvester Co. is one of the largest firms so badly pinched that it will soon close. It will start production cutbacks June 27. By July 3, 90 per cent of its operations will be stopped. Companies like White Motor Co. in Cleveland have changed from a six to a five-day week because of lack of steel.

Paradoxically, defense work often will be hit sooner by shortages than civilian operations. One reason is that the steels needed in defense have been short ever since Korea began. Wheels for military vehicles use heavier steel than commercial counterparts and are a limiting factor in army truck production. Dodge will have to close down that truck department June 25. Defense contractors may be helped by a move to reopen a few mills (see the following story).

Still Good — Despite scattered shutdowns, the steel supply situation is still surprisingly good. No serious curtailments are reported in the Pittsburgh area. Steel-using operations are good in New England. The Chicago district plants, except for Harvester, are doing well. GM's Electro-Motive Division has three weeks' supply. Graver Tank & Mfg. Co. has stocks that will last two or three weeks more. On the eastern seaboard from New York to Philadelphia, most companies have enough to last at least until the end of the month. Most Westinghouse Electric Corp. plants can operate another two to four weeks without serious curtailments. The company, like many others, thinks its greatest problems will occur after the strike ends because 10 to 14 days are required to get the mills back into full operation.

Some companies are scheduling vacation shutdowns to begin now so as to save steel. Such a firm is Precision Drawn Steel Co., Camden, N. J. Others think they can hold out for another two weeks, and then vacations will conserve their dwindling supplies. Companies with those plans include such firms as Brillo Mfg. Co., Brooklyn, N. Y., and Simmons Co., Elizabeth, N. J., the mattress maker.

Flurry — The steel strike has caused a new flurry in conversion deals, especially by auto makers, but thus far the tonnage involved is minor. One reason: One of the biggest steel companies that participated in conversion operations in the past—Inland Steel Co.—is now struck.

More gray market characters are showing up now than for a long time, but thus far the tonnage moving by the back way is practically nil.

Some Struck Mills To Open

Capacity will be started to produce 250,000 tons of finished steel monthly for the military

ENOUGH STRUCK steel mills and supporting facilities will be opened to produce for the military at the rate of 250,000 tons of finished steel a month. The military needs about 500,000 tons of finished a month, so another 250,000 will be provided by the unstruck mills still in operation.

Ordering and scheduling clerks have entered the plants designated to be opened, but late

last week the identity of the facilities wasn't officially disclosed because Steelworker President Philip Murray wanted the opportunity first to sell the idea to his operating locals, especially to the ones that aren't involved in the plan.

Steel for What?—The steel will go for direct military and atomic energy programs bearing the symbols A through E and for machine tools and common components that are closely related with military needs. Plants affected will have all departments opened that are necessary to turn out the finished product, including even ore handling facilities.

The program will be administered by NPA's Iron & Steel Division. The division chief is J. Douglas Darby, on leave from U. S. Steel Co. A co-ordinating committee headed by John D. Small, chairman of the Munitions Board, will work out details of operation between the union locals and management. The amount of finished steel to be produced is relatively small because when the industry is going full blast it can turn out 6.5 million tons of finished steel a month. Even the facilities still operating turn out 500,000 tons of finished a month now, but part of the steel they produce is not the kind wanted by the military.

Long Range — The reopening plan is a stop-gap idea for meeting the steel losses. Longer range schemes are also taking shape. There's no present plan to reduce or cancel third-quarter allotments, except perhaps for construction. Calling back tickets is considered an impossible job. The uncashed third-quarter allocations will be carried over into the fourth quarter. So, fourth-quarter program levels will be substantially lower than had been expected, to take up part of the carryover. The impact of the loss will be spread over several quarters.

Officials are a little worried about the fact that fourth-quarter advance allotments are set at 100 per cent for the military and about 40 per cent for everyone else. That means the entire military program may be pushed back a full calendar quarter. It means that a super priority for the military will have to be continued after steel production is eventually restored to normal.

Emphasis — Plans for dealing with the mounting steel losses made more progress last week than plans for stopping the strike. Only a few negotiations between steelworker locals and smaller companies made much progress. Universal-Cyclops Steel Co., with an annual ingot capacity of 70,160 tons and a plant at Bridgeville, Pa., signed at terms close to the WSB recommendations. So did Midvale Co. Rotary Electric Steel Co., Detroit, and Lukens Steel Co., Coatesville, Pa., last week were reportedly close to settlement. Lukens has an annual capacity of 675,000 ingot tons.

Use of the Taft-Hartley Act last week appeared to be the only way of stopping the strike immediately. But President Truman says he doesn't have to use the law even if the House passes something similar to the Senate's Byrd Amendment which "requests" the Chief Executive to use it. The House is expected to pass such a "request," but it moves more slowly than does the other chamber.

Strikes' Toll: 34 Million Tons

Major strikes cost the nation more than 34.5 million tons steel between the end of World War II and June 15, this year, estimates the American Iron & Steel Institute. This total includes the nearly 5.5 million tons lost in late April, early May and the first two weeks in June, 1952.

The 34.5 million lost tons are equal to the finished steel used in 15 million passenger cars, almost the total output for the three years 1947-1951, and equal to the finished steel shipped directly in 1951 to the auto industry, railroads, shipbuilding, aircraft, ordnance, machinery, industrial equipment and tools.

Strikers' Insurance Assured

To make sure that its workers won't let their life and health insurance policies lapse, even if they are on strike, Youngstown Sheet & Tube Co. will advance July premiums on its life and health policies for its workers because most are getting no pay in June.

Amended Tool Order Soon

It allows builders to take unrated orders. Some $500 million in defense jobs still due

NPA WILL RELAX provisions of the machine tool order. An amendment will allow the builders to accept unrated orders for tools provided acceptance will not hold up production and delivery of rated orders (see STEEL, June 9, p. 66).

The amendment which has been approved by the government and industry will be issued promptly. The tool builders want the change so they can nurture some of their foreign markets, meet foreign competition in this country and keep healthy a few of the companies whose backlogs are dwindling the most rapidly.

Not Applicable—The new order will not apply to 20 types of tools made by about 60 builders. NPA explains that makers of those tools still have long backlogs. An estimate of additional requirements of the military indicate that an additional $500 million in orders will be placed before the end of 1953. About 35,000 tools are involved.

The Defense Department says that the cancellation peak has passed and that the Air Force will continue the orders for tools needed to build a 95-group Air Force.

Detroit Steel To Expand

Detroit Steel Corp., Detroit, will proceed with its plans to expand its ingot production by more than 95 per cent and to provide finishing facilities to convert the entire ingot output. This decision follows receipt of Reconstruction Finance Corp.'s approval of a loan of $45 million for partial financing to complete an expansion program of the firm's facilities at Portsmouth, O.

The company is providing its own funds to pay for a portion of the program and expects to add more, up to 25 per cent of the total cost. The project includes construction of a hot-rolled sheet and strip mill, a cold-rolled sheet and strip mill, a 1400-ton blast furnace, a blooming mill with soaking pit, and four 250 ton basic open-hearth furnaces.

Wide World

Versatile Vendor

Hot and cold sandwiches, pies and cake, juices, plain milk, chocolate milk and hot coffee are served by this Lunch-O-Mat made by Statler Manufacturers Corp. Hot sandwiches are cooked in 10 seconds by radar; each cup of coffee is made instantaneously with cold running water. Naturally, it has a change maker, too

Copper Bonus: Why's and Wherefore's

Because of the 100-million-pound increase in allotment authority consumer durable manufacturers will get up to 50 per cent of their average 1950 quarterly copper use

ONE OF INDUSTRY'S biggest headaches—the copper shortage—will be assuaged by an additional 100 million pounds of copper wire and brass mill allotment authorization in the third quarter.

NPA provided the bromo when it granted copper users the right to take up foreign entitlement of copper amounting to about 50,000 tons monthly. U.S. users of foreign copper are expected to import larger amounts of the metal than they have up to now because of the new price formula that allows them to add 80 per cent of the extra cost of foreign metal over 24.5 cents per pound to ceiling prices on their products (see also page 157).

Business Boon—To permit manufacturers to use the additional supply, the level of allotments for consumer goods will be increased from 35 to 50 per cent. Allotments for defense-supporting activity will also be hiked. Sufficient copper, too, will be authorized for automobiles and diesel locomotives to take care of authorized production. Builders are being given authority to increase self-certification for commercial construction from 200 pounds to 750 pounds per project per quarter. NPA figures all that can be done and still leave some 5,000 to 10,000 tons a month for the copper stockpile.

Domestic Distribution — Third quarter allotments were originally based on 114,000 tons of refined copper per month. Now U.S. producers can get 133,000 tons—80,000 from domestic and 53,000 tons from overseas sources, principally Chile. To assure equitable distribution, allocations to producers will be on this basis of 60 per cent domestic supply and 40 per cent foreign. That will take an amendment to the copper order, M-16. NPA is also planning to make advance allocations for the foreign copper at 100 per cent to allow for placement of contracts for foreign copper.

The additional 100-million-pound allotment will raise distribution of copper tickets to 1,611,796,000 pounds and will be distributed approximately this way:

35 million pounds to be taken up by increased self-certification.
5 million pounds to claimant agencies.
56 million pounds to NPA Industry Divisions.

Electroplater Plagued

The nickel shortage combined with stiffer automobile and ordnance specifications continue to plague commercial electroplaters and plating equipment manufacturers. (See also page 157).

Concern over the twin problems and their solution was reflected at the American Electroplaters Society's 39th annual convention and Industrial Finishing Exposition in Chicago last week.

Principal emphasis was on development of substitute processes to meet the nickel shortage. White brass plating appears to have brighter prospects than other substitutes. The process uses 8 per cent copper and 92 per cent zinc alloy over which chromium is plated with a clear lacquer on top.

Fashion Plate—Business for the plating industry is off about 10 to 15 per cent. Reason: Material shortages. The industry is extremely sensitive to changing fashions and to metal supplies.

Newly elected officers are: President, F. J. MacStoker, superintendent of finishing, Farrand Optical Co. Inc., New York; vice presidents, G. P. Swift, electroplating consultant, Watertown, Mass., and R. A. Schaefer, director of research, Cleveland Graphite Bronze Co., Cleveland.

U. S. Foundries To Make Bids

Steel foundries in this country will be given an opportunity to accept or turn down Air Force orders for large castings before any purchases are made abroad. This decision was reached following strong protest over the original plan (see STEEL, June 9, p. 68) to procure from European foundries the castings required for 17 mammoth presses to be built for the Air Force.

Between 150 and 200 castings, weighing from 1275 pounds to 353,000 pounds, are involved in the project.

DURABLE GOODS INDUSTRIES	1951 Jan.-Mar.	1951 Apr.-June	1951 July-Sept.	1951 Oct.-Dec.	1952 Jan.-Mar.	1952 Apr.-June	1952 July-Sept.
	(Millions)						
PRIMARY IRON AND STEEL	$190	$283	$352	$479	$356	$439	$397
PRIMARY NONFERROUS METALS	45	62	70	100	109	139	129
FABRICATED METAL PRODUCTS	97	104	100	119	87	100	73
ELECTRICAL MACHINERY, EQUIPMENT	62	87	90	120	80	102	115
MACHINERY (except ELECTRICAL)	121	149	181	224	176	192	161
MOTOR VEHICLES, EQUIPMENT	136	193	207	202	171	235	*
TRANSPORTATION EQUIPMENT (not MOTOR VEHICLES)	25	42	54	62	65	78	60

*Data not available

Capital Outlays Holding at Record Rates

For the first nine months of 1952, outlays for new plant and equipment by U.S. business are expected to total $18.1 billion, 9 per cent more than in the corresponding period of 1951. It appears likely that the previous estimate of $24.1 billion for the full year will be exceeded. Fixed investment programs of manufacturing concerns are relatively stable at high levels. Offsetting effects of increasing programs in petroleum, chemicals and nonferrous metals are holding the line as most other manufacturers reduce plans for capital expenditures

New Era for Coal

Defense solid fuels administrator sees the biggest future in coal-to-oil developments

A NEW ERA of broadened uses of coal is beginning, says Charles W. Connor, Defense Solid Fuels Administrator.

The time is not far distant when millions of tons of coal will be consumed annually for the production of synthetic liquid fuels and critical chemicals.

By the Quadrillions—Energy demands are increasing at an amazing rate. Total demand for energy increased from 24 quadrillion Btu's in 1926 to about 39 quadrillion in 1951 and is expected to increase during the next quarter century to about 80 quadrillion Btu's. Bulk of this energy supply must be provided by our resources of coal, petroleum and natural gas. Our total consumption of petroleum and its products in 1951 amounted to about 2721 million barrels. Our proved reserves of petroleum amount to only about 32 billion barrels, or only about 12 times our present annual consumption.

"While I do not believe we are running out of oil, our demand for oil has been increasing more rapidly than we have been able to increase our domestic production," Mr. Connor said. We were dependent upon foreign sources for about 11 per cent of our total new supply and he expects the difference between total demand and domestic production will continue to increase. This situation provides a compelling argument for development of supplementary sources of a domestic supply of liquid fuels.

Coal to Oil—He urges the rapid development of a position of preparedness with respect to the production of liquid fuels from coal. Our resources of coal are virtually unlimited, having been estimated to be sufficient to meet foreseeable demands for at least 1000 years. Present costs of obtaining liquid fuel by the coal-hydrogenation process are relatively high, but adjustments in the process are being developed which will cut operating costs and yield a larger output of profitable chemical products.

Officials of Union Carbide & Carbon Corp. are reported to be sufficiently impressed by the potentialities of the special coal-hydrogenation process they have developed that they are talking in terms of a possible investment of $500 million on new coal-hydrogenation facilities.

Other processes which are being studied for the conversion of coal to oil include the Fischer-Tropsch process and underground gasification of coal. The Bureau of Mines believes that in the near future the over-all operation using gasification and synthesis will be developed to a point where commercial plants can be considered.

Mines Get Priorities Aid

Priorities assistance available to the mining industry was liberalized by Defense Materials Procurement Agency.

Revisions of the DMPA order MO-7 and National Production Authority order M-78 provide:

Minor capital additions up to $5000 per item, to a total of 20 per cent of the producer's established quota for maintenance, repair and operating supplies may be made with self endorsed ratings. The limit formerly was $2000. The increase will facilitate purchase of many items of small equipment needed in day-to-day mining operations, such as slushers, tuggerhoists, drifters and screens. In addition, special emergency assistance is now available to domestic producers in case of major breakdown caused by disaster.

Foreign producers now have 60 days following receipt of their serial number in which to establish their MRO quota. Quotas already established by either DMA or DMPA remain valid.

The new regulations apply to all "serialized" mine, mill and smelter operators who have registered with DMPA and been assigned a serial number for priority and allocation aid under the DMPA program.

More Export Red Tape

If you're an exporter, sharpen pencils because starting July 1 more forms must be filed

STARTING July 1, export license applicants who fill recurring orders from abroad must file with Office of International Trade one copy of Form IT-843 for each consignee with whom they have a continuing relationship.

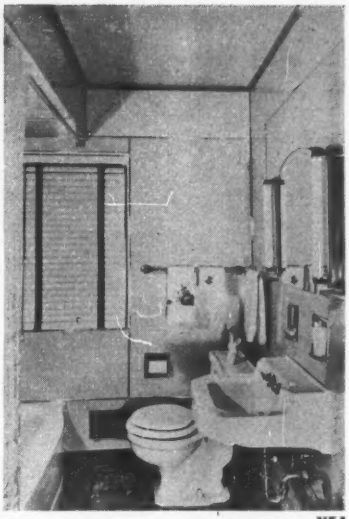
This is to be filled in by the foreign customer and should cover all proposed shipments to that consignee for the year beginning July 1. End-use statements by letter or in other written form no longer will be valid after that date. Purpose of the change is to provide a better check for preventing transshipment of U. S. goods to unauthorized destinations.

Tighter Aluminum — Beginning with the fourth quarter of 1952, applicants for licenses to export aluminum materials for construction will be required to report their 1949 and 1950 exports of such materials to OIT, on Form IT-821. Purpose is more equitable distribution of the export quotas for such aluminum materials. The bulk of the materials will be made available to the "historical" exporters, but a portion will be reserved for others.

The new action applies to the commodities covered by Schedule B Nos. 618984 (aluminum door and window sash, sections and frames) and 618987 (aluminum materials for construction not elsewhere classified in Schedule B). Exporters who shipped $5000 worth or more of the commodities included in each of these two classifications in either 1949 or 1950 must report the quantity and total dollar value of such exports to each country in each of these two years.

Exception—Project license applicants who are subject to other reporting provisions are not required to file Form IT-821. All other export license applicants, in preparing the form, should omit previous exports to Canada; territories, dependencies and other possessions of the United States; and U. S. trust territory of the Caroline, Marshall and Marianas Islands.

While exporters are permitted to ship up to 10 per cent more than the quantities specified in their export licenses, in order to allow for small excesses in weight or volume arising through mill overruns or packing or loading practices, OIT has noted that some exporters have been shipping the full amount specified and then have tried to export, as a separate shipment, the 10 per cent additional allowed for tolerance. Such further shipments are not permissible, OIT points out. Whenever one or more partial shipments of a licensed commodity have been made, the tolerance is allowed only on the unshipped balance, except for iron and steel products and tinplate. For those commodities, covered by OIT's processing codes STEE and TNPL, the 10 per cent tolerance is allowed on the basis of the total quantity stated in the license.



NEA

FIXTURE FASHIONS
. . . boost for sagging sales

Plumbing Goods Boom: Down the Drain

Sales are off 25 to 40 per cent on most plumbing fixtures for the first half of this year. Builders' stockpiling is blamed by manufacturers who look for a better last half

STOCKPILING pulled the plug on plumbing equipment sales in the first half of 1952.

High water mark was reached in 1950-51 as contractors bought everything they could lay their hands on against expected shortages. Now they're using the stocks, and plumbing equipment men are seeing the sales level fall.

In Hot Water—Plumbing equipment makers admit they're partly responsible for prolonging the sales drought. As an attempt to get things flowing again, many manufacturers cut prices up to 20 per cent below ceilings. Contractors took that as a sign there would be further price reductions and started buying in smaller quantities when they did buy.

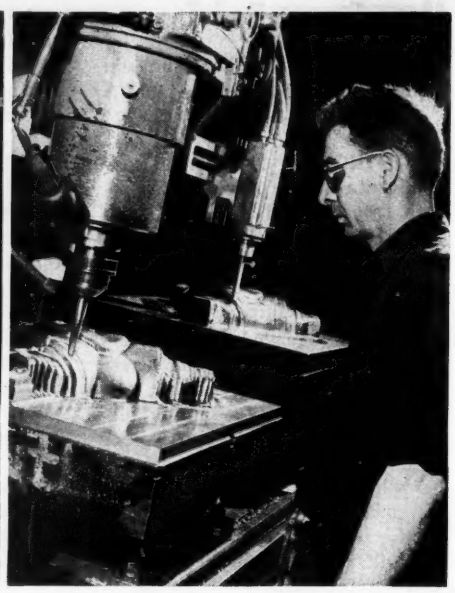
Now plumbing men figure it's going to take a lot to convince them prices won't drop further. Stocks of virtually all plumbing items are plentiful. Materials are no longer a problem, barring a long steel strike, and the prices of many materials have been reduced. Builders, facing an uncertain market, feel more urgency about holding down costs.

Gap in the Middle—Mirroring the urgency is an interesting split in the plumbing fixtures market. Persons building their own homes are buying the best items they can get. Their houses are costing them plenty anyway and they look at long-range investment. Builders of housing developments, however, in many cases buy the cheapest.

That leaves a gap in demand for the middle-priced, middle-quality items that normally are the bulk of the plumbing fixture sales. Coupled with stockpiling, it's a gap that is hard to fill.

Fashions Figure—One segment of the plumbing supply industry posted an increase in sales during the first part of this year. Producers of formed steel plumbing fixtures were boosted by design changes in new models for their style-conscious market. Another factor may have been the impending steel strike-shortage situation. Manufacturers here may find stockpiling taking its toll one of these days.

But plumbing equipment makers figure stockpiles can't last forever. Already there are signs that builders are using up their hoards. When that happens sometime this fall, water should start running back into the tub.



United Effort Helps United Aircraft

Subcontracting is an important cog that makes the wheels turn for the United Aircraft Corp. At left, Sikorsky Aircraft Division purchasing agents consult with officials representing a few of the thousands of small businesses which supply United Aircraft. At right, a workman at the Wyman-Gordon Co., Worcester, Mass., machines a die used in forging propeller hubs for the Hamilton Standard Propeller Division

Subcontractors Set Sights on More Arms Contracts

SUBCONTRACTORS may find it easier to zero-in on procurement targets, as Army Ordnance increases awards for weapons production.

Already metalworking companies received large orders for arms and ammunitions from the Corp's district offices. And further increases in ordnance procurement are expected as new weapons and modifications develop.

Among the latest ordnance contracts are those awarded to Buffalo Arms Inc., Buffalo; Chain Belt Co., Milwaukee; A. O. Smith Corp., Milwaukee.

Buffalo Arms announces a $4 million order from the Rochester Ordnance District for automatic 22 mm guns and parts. The contract will be filled by three plants of the company's parent firm, Frontier Industries Inc.

Chain Belt Co. will start production on 105 mm howitzers at its new plant at Wauwatosa, Wis., by July 1. The new plant, costing $500,000, will employ about 250 workers, says William Messinger, ordnance manager for Chain Belt. Under the defense order everything but the howitzers' carriages will be assembled at the plant. Valuation of the contract is undisclosed.

A. O. Smith Corp. got a $5 million contract for bomb casings. The casings will be manufactured in the firm's Milwaukee plant and shipped elsewhere for filling.

If lack of sufficient defense contracts is one of your procurement problems, check over the table at the bottom of the page. Each contract has a valuation of, or in excess of, $250,000.

Small Firms To Get War Work

A $3 million contract for the manufacture of cartridge storage cases will be awarded to a group of 22 small business firms in Illinois. This group, a defense pool under the name of Peoria Consolidated Manufacturers Inc., was granted a certificate of competency by Small Defense Plants Administration.

PRODUCT	CONTRACTOR
Milling Machines	Kearney & Trecker Corp., Milwaukee
	Brown & Sharpe Mfg. Co., Providence, R. I.
Hobbing Machines	Barber-Colman Co., Rockford, Ill.
Boring & Turning Mills	Consolidated Machine Tool Corp., Rochester, N. Y.
Processing Machines	Morse Instrument Co., Hudson, O.
Trucks, Fire	Ward LaFrance Truck Corp., Elmira, N. Y.
Motor Vehicle Parts	Blackstone Corp., Jamestown, N. Y.
	Caterpillar Tractor Co., Peoria, Ill.
Disc Assemblies, Road Wheel	Motor Wheel Corp., Lansing, Mich.
Trucks, 2½ Ton	General Motors Corp., Detroit
Trailers	McCabe-Powers Auto Body Co., St. Louis
Aircraft Indicators	Kollsmann Instrument Div. of Square D. Co., Elmhurst, L. I., N.Y.
Cylinder Assemblies	Alloy Products Corp., Waukesha, Wis.
Oscillators	Northern Radio Co., Seattle
Fuel Tanks	Seeger Refrigerator Co., St. Paul
Radio Sets	Emerson Radio & Phonograph Corp., New York
	Raytheon Mfg. Co., Waltham, Mass.
	Motorola Inc., Chicago
Electron Tubes	Radio Corp. of America, New York
	Eitel-McCullough Inc., San Burno, Calif.
Aircraft Parts	United Aircraft Corp., Pratt & Whitney Aircraft Div., E. Hartford, Conn.
Guns, Twin, 40 MF	American Car & Foundry Co., New York
Shells, 75 mm	American Machinery Corp., Orlando, Fla.
Shells, 105 mm	Kirby Steel Co., Anniston, Ala.
Metal Parts for Boosters	Grand Rapids Hardware Co., Grand Rapids, Mich.
Metal Parts for Primers	E. A. Laboratories Inc., Brooklyn, N. Y.

CHECKLIST ON CONTROLS

GOVERNMENT control orders are digested or listed each week in this "Checklist on Controls." For complete copies of NPA orders, write to NPA Distribution Section, First Basement, New GAO Bldg., Washington 25. For copies of OPS orders, contact nearest OPS district or regional office. For copies of OPS news releases, write David S. Phillips, director, OPS Administrative Services Division, Temporary E Bldg., Washington 25.

Materials Orders

MINING MACHINERY—Amendment of June 13, 1952, of NPA Order M-78 is to help mining operators obtain equipment and supplies. The amendment was effective June 13.

STEEL DISTRIBUTORS—Amendment of June 16, 1952, of Direction 1 to NPA Order M-6A extends until Dec. 31, 1952, the procedures that aid makers of machine tools in obtaining steel from warehouses. The aid was to have expired June 16.

NAPHTHENIC ACID—Schedule 1 to NPA Order M-45 removes allocation controls from naphthenic acid. Schedule 1 was issued June 17, 1952, and made effective on that date.

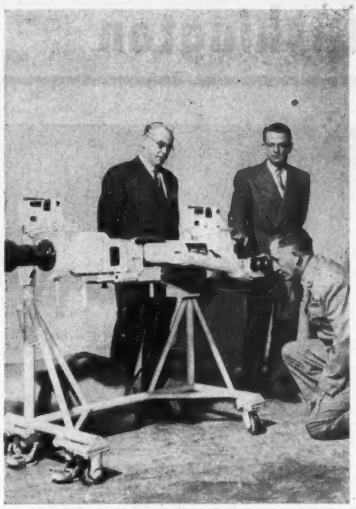
COPPER—Amendment of NPA Order M-100 will now permit self-authorization of 50 pounds of copper per dwelling unit for houses with steel pipe water distribution. Self-certification of 170 pounds of copper per dwelling unit will be allowed for houses with copper water distribution systems. Two hundred fifty pounds of aluminum per dwelling unit will be allowed for the first time in the third quarter.

Controlled Materials Plan

EMERGENCY STEEL—Direction 4 to CMP Regulation 3 is emergency action to channel Class A and B products containing steel into the defense program during the steel strike. Aim is to provide an uninterrupted flow of components and subassemblies containing steel to aircraft and ammunition plants, atomic energy projects and other vital defense programs. This will be accomplished by temporarily according special preference status to DO rated orders for such products. Direction 4 was issued June 16, 1952, and was effective on that date.

ALUMINUM, COPPER—Amendment of Direction 1 to CMP Reg. 1 provides authority to self-certify the purchase of 10,000 pounds of copper and copper-base alloy products and 20,000 pounds of aluminum regardless of use during the base period, starting in the fourth quarter. Self-certification of 20,000 pounds of copper and 40,000 pounds of aluminum is allowed in the fourth quarter, provided those figures do not exceed base period use. A maximum self-certification of 40,000 pounds of copper and 60,000 pounds of aluminum is allowed provided those ceilings do not exceed 75 per cent of the the base period use.

ALUMINUM—Amendment of CMP Reg. 6 allows 2000 pounds of aluminum per project per quarter for industrial construction instead of 1000 pounds. For all other types of construction except recreational and amusement construction and public roads, a maximum of 750 pounds of copper per project per quarter and 1000 pounds of aluminum will be allowed.



Finding the Range

Officials at Northrop Aircraft Inc., Anaheim, Calif., inspect one of the T-41 optical range finders which the firm has been making since last November. To be used on the Army M-47 tank, the device works on the stereoscopic principle. One of seven firms in the nation producing it, Northrop is the only company on the West Coast manufacturing the instrument

Price Regulations

COMPRESSORS—Ceiling Price Regulation 150 issued June 12, 1952, is a tailored price regulation covering manufacturers' sales of small pneumatic air compressor. It establishes ceilings at 25 per cent above prices in effect on June 24, 1950, and gives about the same levels as established under the General Ceiling Price Regulation. CPR 150 supersedes ceiling prices established under CPR 30 and under the GCPR. CPR 150 was effective June 17.

SUBCONTRACTING — Amendment 2 of Supplementary Regulation 4 to Ceiling Price Regulation 30 changes pricing provisions for manufacturers of machinery and related goods who employ subcontractors. Manufacturers of machinery and related goods who have included additions to cost due to increased subcontracting in computing Capehart ceiling price adjustments must recompute allowable additions if increased subcontracting drops below 90 per cent of the amount of subcontracting in the last fiscal half year before July 26, 1951. Previously, additions for increased subcontracting could be used only as long as the manufacturer continued to subcontract to at least as large an extent as he did during his fiscal half year before July 26, 1951. Amendment 2 was issued June 12, 1952, and made effective June 17.

Appointments in Washington

Robert Cass, assistant to the president, White Motor Co., Cleveland, was appointed director of the Motor Vehicle Division, National Production Authority. Lawrence S. Beerman of Columbus, O., and formerly with Ford Motor Co., was named assistant to Mr. Cass.

John Ransom of Louisville, on leave from Minneapolis-Moline Co., Minneapolis, was appointed director of the Agricultural Machinery & Implements Division, National Production Authority. William D. Hosford Jr. of Deere & Co., Moline, Ill., was named assistant to Mr. Ransom.

Fasteners: Expansion Goal Set

An interim expansion goal for precision and large-size fasteners requiring a $33 million capital investment in added production capacity to be completed by July 1, 1953, has been set by Defense Production Administration. Establishment of this goal does not constitute a commitment to furnish controlled materials for any given quarter, DPA explained. The actual allotment of materials each quarter will be conditioned by available supply and competing demands.

This industry is of great importance to the nation's economy since about 2 per cent of all finished steel produced is shipped to the industrial fastener industry.

The industry's production equipment, purchased during World War II, is now eight to ten years old. In most instances this equipment is unable to hold the close tolerances required for today's defense work. Some new equipment may be required to correct this condition and to meet the increasing defense needs for these special close tolerances and high-finish fasteners.

Compared to the industry's World War II capacity of about 170 million pieces per day, the fastener industry today is producing 220 million pieces on each shift. Demand has shifted in recent years to heavier and special type fasteners, requiring more secondary operation production equipment, such as heat-treating and grinding facilities.

As of Apr. 28, DPA issued 47 amortization certificates to the industry, involving proposed investment of $12,314,215, and had pending 66 applications, involving expenditure of $12,168,187.

Windows of Washington

By E. C. KREUTZBERG *Washington Editor*

United Press

Weighing Political Consideration

No matter who wins the election, button makers can't lose in 1952. Orders from Democrats and Republicans alike should call for 100 million of the lapel gimmicks. Green Duck Metal Stamping Co., Chicago, claims about 80 per cent of the nation's business and has turned out the partisan badges since 1906

Radioisotopes are finding widespread use in industry, perhaps among your competitors. Better check into them or you could be left behind

RADIOISOTOPES are finding uses in industry to the point where it is germane to suggest that companies who are not employing them may be behind the procession.

A good example is the utilization of isotopes as a source of beta rays in thickness gages for measuring sheet and strip steel. Most of the big producers have such installations under study or under way.

Metallurgy Boon—Metallurgical applications predominate. Of the 422 current industrial uses, 151 are in the field of metallurgy. These are just a few:

Investigation of self-diffusion of iron, silver, cobalt and other metals; study of wear of cutting tools, piston rings, hardened steel ball bearings; kinetics of slag-metal reactions involving sulphur and iron; diffusion of hydrogen, sulphur and other elements in steel; measuring the height of the metal burden in cupolas; studies in reducing corrosion of metal surfaces, determining mechanism of surface treatment of metals; evaluating phosphate coatings on steel, and investigations into the mechanics of adherence of enamel to steel, mechanism of chromium plating, etc.; development of aircraft gas turbine instrumentation; determination of impurities in metals; ascertaining reasons for production of radio noises in operation of motors.

Proven—Isotopes now are used extensively in radiography of castings, forgings, and welded and riveted joints.

Interested parties should write to Technical Information Service, Atomic Energy Commission, Oak Ridge, Tenn., for a copy of TID-5078 entitled "Radioisotopes Applications of Industrial Significance." This gives names of companies and institutions using isotopes for industrial purposes and what they are doing with the isotopes.

Escalator Reverse Button . . .

One sign of the times may be a recent interpretation of the Wage Stabilization Board. The cost-of-living regulation as originally written did not take into account the possibility of a declining index. The new interpretations do so by permitting the parties a choice of indices within a specified period of time.

WSB's wage escalator has a shiny new reverse button. Question: Is forearmed also forewarned?

Army Saves Materials . . .

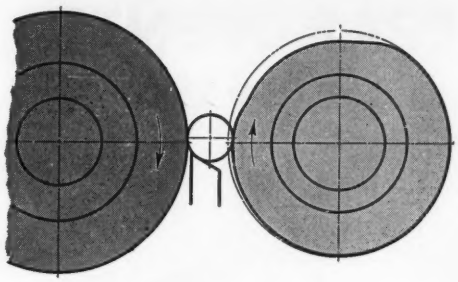
The service brasses aren't dragging when it comes to savings in the use of critical materials. Their program of substitution and conservation was initiated in 1950 to review materials used in items of procurement and determine where economies could be made.

During the final quarter of Fiscal Year 1952, 1 million pounds of copper, 145,000 pounds of nickel and 12,091 pounds of manganese will be saved together with similar savings in zinc, aluminum, molybdenum, steel and vinyl film.

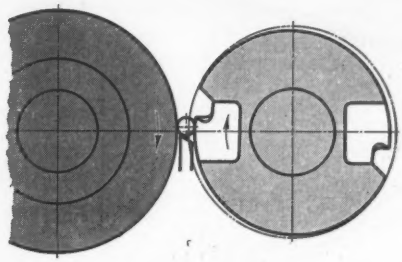
Help, Not Talk . . .

Hardship cases caused by insufficient CMP allotments are getting real help from the Office of Small Business, NPA. Of 539 firms that complained they were faced with failure or a prolonged shutdown owing to low allotments of CMP materials, 452 were granted supplemental allocations.

These allocations amounted to: 6277 tons of carbon steel, 96 tons of alloy steel, 37,103 pounds of stainless steel, 2,172,323 pounds of brass mill copper, 91,257 pounds of wire mill copper, 175,474 pounds of foundry copper and 4,396,816 pounds of aluminum.



Cammed regulating wheel. Work is loaded and ejected at low section of wheel. Production per minute = rpm of regulating wheel.



Double cammed regulating wheel, notched for loading and ejecting the work. Production per minute = 2 x rpm of regulating wheel.

CINCINNATI

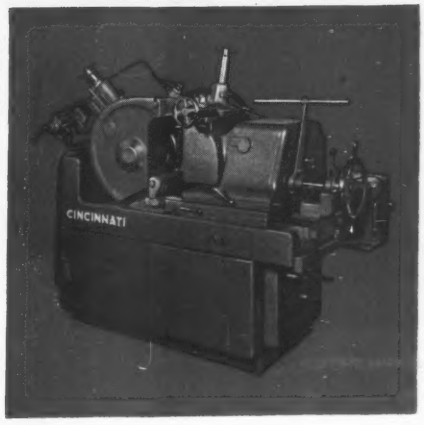
idea for high production

...OF PRECISION GROUND PARTS

Production—1250 per hour. Centerless grinding the stem of automotive valves by the cam infeed method, on a CINCINNATI FILMATIC No. 2 Centerless Grinder.

Have you considered automatic centerless grinding for your precision ground parts? The equipment illustrated here, developed by Cincinnati, shows what can be done. A CINCINNATI FILMATIC No. 2 Centerless Grinder is equipped with an automatic loading device and a cammed regulating wheel. This method of precision grinding (diagramed above) offers several advantages . . . very low cost . . . high rate of production . . . excellent finish . . . accurate sizing . . . elimination of slideway wear. ¶ For today's defense work . . . for future applications when the pressure on machine tools eases a bit . . . the cammed infeed method of centerless grinding is worth serious consideration by cost-conscious engineers in high production plants.

CINCINNATI FILMATIC No. 2 Centerless Grinding Machine. Complete specifications may be obtained by writing for catalog No. G-591.



CINCINNATI GRINDERS INCORPORATED
CINCINNATI 9, OHIO

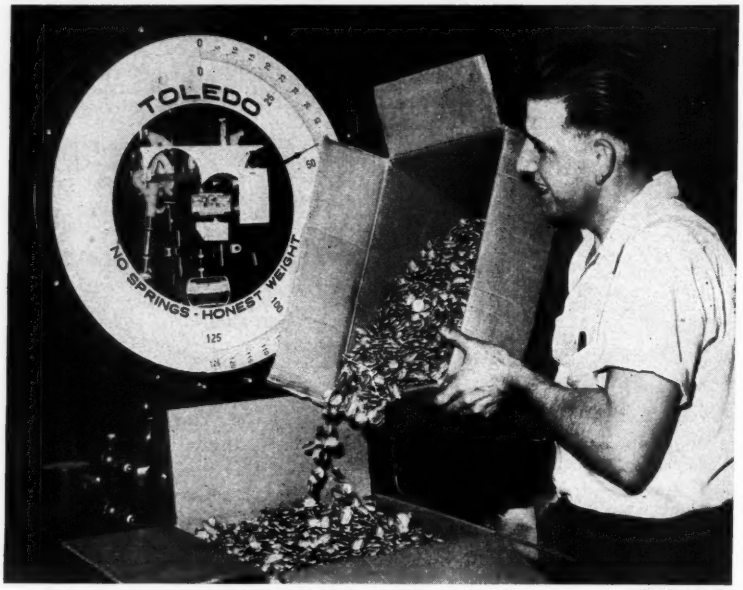
FILMATIC

CINCINNATI

CENTERTYPE GRINDING MACHINES • CENTERLESS GRINDING MACHINES
CENTERLESS LAPPING MACHINES • MICRO-CENTRIC GRINDING MACHINES

Windows of Washington

By E. C. KREUTZBERG *Washington Editor*



United Press

Weighing Political Consideration

No matter who wins the election, button makers can't lose in 1952. Orders from Democrats and Republicans alike should call for 100 million of the lapel gimmicks. Green Duck Metal Stamping Co., Chicago, claims about 80 per cent of the nation's business and has turned out the partisan badges since 1906

Radioisotopes are finding widespread use in industry, perhaps among your competitors. Better check into them or you could be left behind

RADIOISOTOPES are finding uses in industry to the point where it is germane to suggest that companies who are not employing them may be behind the procession.

A good example is the utilization of isotopes as a source of beta rays in thickness gages for measuring sheet and strip steel. Most of the big producers have such installations under study or under way.

Metallurgy Boon—Metallurgical applications predominate. Of the 422 current industrial uses, 151 are in the field of metallurgy. These are just a few:

Investigation of self-diffusion of iron, silver, cobalt and other metals; study of wear of cutting tools, piston rings, hardened steel ball bearings; kinetics of slag-metal reactions involving sulphur and iron; diffusion of hydrogen, sulphur and other elements in steel; measuring the height of the metal burden in cupolas; studies in reducing corrosion of metal surfaces, determining mechanism of surface treatment of metals; evaluating phosphate coatings on steel, and investigations into the mechanics of adherence of enamel to steel, mechanism of chromium plating, etc.; development of aircraft gas turbine instrumentation; determination of impurities in metals; ascertaining reasons for production of radio noises in operation of motors.

Proven—Isotopes now are used extensively in radiography of castings, forgings, and welded and riveted joints.

Interested parties should write to Technical Information Service, Atomic Energy Commission, Oak Ridge, Tenn., for a copy of TID-5078 entitled "Radioisotopes Applications of Industrial Significance." This gives names of companies and institutions using isotopes for industrial purposes and what they are doing with the isotopes.

Escalator Reverse Button . . .

One sign of the times may be a recent interpretation of the Wage Stabilization Board. The cost-of-living regulation as originally written did not take into account the possibility of a declining index. The new interpretations do so by permitting the parties a choice of indices within a specified period of time.

WSB's wage escalator has a shiny new reverse button. Question: Is forearmed also forewarned?

Army Saves Materials . . .

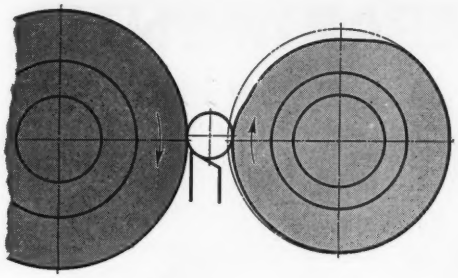
The service brasses aren't dragging when it comes to savings in the use of critical materials. Their program of substitution and conservation was initiated in 1950 to review materials used in items of procurement and determine where economies could be made.

During the final quarter of Fiscal Year 1952, 1 million pounds of copper, 145,000 pounds of nickel and 12,091 pounds of manganese will be saved together with similar savings in zinc, aluminum, molybdenum, steel and vinyl film.

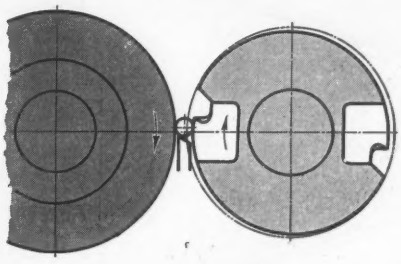
Help, Not Talk . . .

Hardship cases caused by insufficient CMP allotments are getting real help from the Office of Small Business, NPA. Of 539 firms that complained they were faced with failure or a prolonged shutdown owing to low allotments of CMP materials, 452 were granted supplemental allocations.

These allocations amounted to: 6277 tons of carbon steel, 96 tons of alloy steel, 37,103 pounds of stainless steel, 2,172,323 pounds of brass mill copper, 91,257 pounds of wire mill copper, 175,474 pounds of foundry copper and 4,396,816 pounds of aluminum.



Cammed regulating wheel. Work is loaded and ejected at low section of wheel. Production per minute = rpm of regulating wheel.



Double cammed regulating wheel, notched for loading and ejecting the work. Production per minute = 2 x rpm of regulating wheel.

CINCINNATI

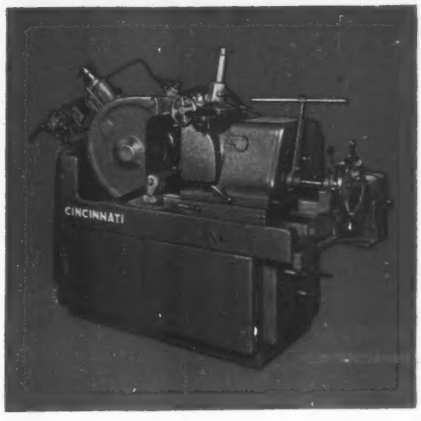
idea for high production

. . . OF PRECISION GROUND PARTS

Production—1250 per hour. Centerless grinding the stem of automotive valves by the cam infeed method, on a CINCINNATI FILMATIC No. 2 Centerless Grinder.

Have you considered automatic centerless grinding for your precision ground parts? The equipment illustrated here, developed by Cincinnati, shows what can be done. A CINCINNATI FILMATIC No. 2 Centerless Grinder is equipped with an automatic loading device and a cammed regulating wheel. This method of precision grinding (diagramed above) offers several advantages . . . very low cost . . . high rate of production . . . excellent finish . . . accurate sizing . . . elimination of slideway wear. ¶ For today's defense work . . . for future applications when the pressure on machine tools eases a bit . . . the cammed infeed method of centerless grinding is worth serious consideration by cost-conscious engineers in high production plants.

CINCINNATI FILMATIC No. 2 Centerless Grinding Machine. Complete specifications may be obtained by writing for catalog No. G-591.



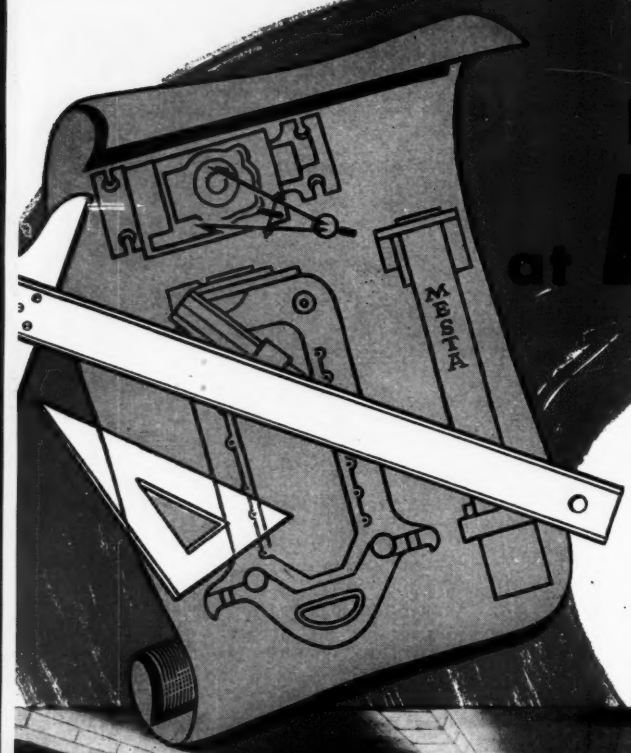
CINCINNATI GRINDERS INCORPORATED
CINCINNATI 9, OHIO

FILMATIC

CINCINNATI

CENTERTYPE GRINDING MACHINES • CENTERLESS GRINDING MACHINES
CENTERLESS LAPPING MACHINES • MICRO-CENTRIC GRINDING MACHINES

ENGINEERING DEPARTMENTS at MESTA

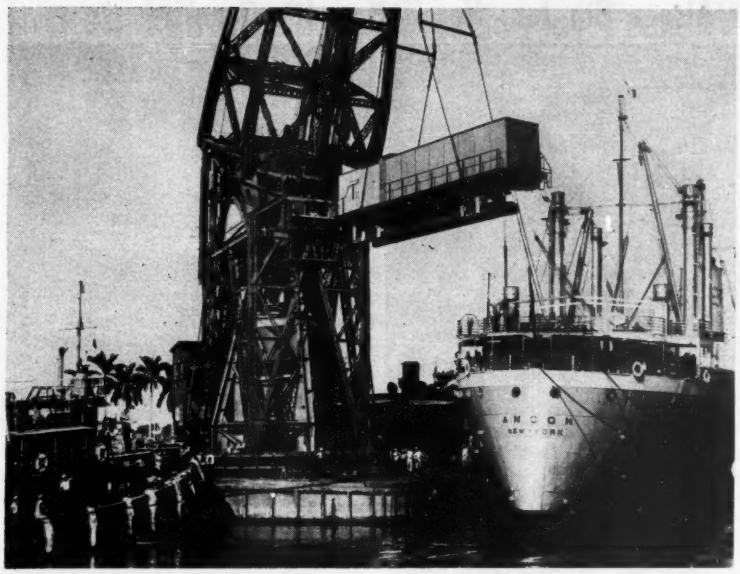


A section in one of the Mesta Engineering Departments, where machinery to fit individual requirements is designed and plans for complete plant projects are developed. These include not only designs for the mechanical equipment built by Mesta, but also for buildings, foundations, electrical distribution systems, and all the engineering that is required for the creation of a modern industrial plant.

Designers and Builders of Complete Steel Plants

MESTA MACHINE COMPANY

PITTSBURGH, PENNSYLVANIA



All Ashore That's Going Ashore

New American Locomotive-General Electric diesel, one of three Alco-GE 1600-horsepower road switchers, is still enclosed in its packing case as it is hoisted ashore from a ship at Cristobal in the Canal Zone. Destined for the Panama Railroad Co., locomotives of this type are built by American Locomotive Co. in Schenectady, N. Y., are used for switching, freight and passenger assignments

Japan Eyes Adventure in India

Takasaki, the Japanese who headed his country's Manchurian industrialization, now has high hopes for a Japanese-sponsored steel plant in India

JAPAN IS planning to try to become a "steel-have" nation again—this time in India instead of Manchuria.

Another Nightmare?—The India adventure is the dream of Tatsunosuke Takasaki, Japanese industrialist who headed the Manchurian industrialization program. Mr. Takasaki had a rough time with Gen. Douglas MacArthur and his occupation forces but was given a clean "bill of health" by occupation authorities later, and now that the Japanese-U.S. peace treaty has been signed, his industrial fortunes are rising again.

He's trying to organize the India Development Co. to build two 1200-ton blast furnaces in India near a newly discovered rich iron ore deposit. He said the blast furnaces' output first will be shipped to Japanese steel plants, but later a steel plant would be erected beside them.

Adventurous. — The 68-year-old Japanese is president of Aetna Japan Co. Ltd., big market of steel plant equipment, and is a director of many other Japanese firms including steel companies. He spent many years in Manchuria, later was captured and held by the Communists but escaped back to Japan.

He points out that Japan urgently needs iron and steel if the planned re-industrialization is to be accomplished—and Japan cannot live except as an industrial nation. Its 84 million population is crowded into a land area comparable with California and only 10 or 15 percent of it may be cultivated. Therefore, he said, Japan's only hope is in industry—and she is too poor in her own resources to be self-contained.

Not Competitive—He points out that Japan never could hope to compete in world markets with cheap steel, particularly against Belgium, France and Germany which have cheap labor, good steel plants and plentiful supply of raw materials.

However, the India development, he says, might have the effect of paring down Japan's disadvantage. The new ore body has a plentiful supply of ore which tests 65 percent iron.

Well Situated—The furnaces also would have plentiful nearby supplies of high-quality coking coal, making it possible to produce the iron cheaply, then shipping it to Japan.

Coking coal in Japan now costs $26 a ton, compared with $5 to $8 a ton in the United States.

Because of Coke — That, Mr. Takasaki explains, accounts in part for the high price of steel in Japan, despite the very low steel wage rates in the country. Japanese steelworkers, the elite of industrial workers get the equivalent of 19 or 20 cents an hour compared with $1.80 an hour average for Americans.

But steel is very expensive, costing $400 to $500 a ton for tin plate, which costs less than $200 in the U. S. Pig Iron costs over $100 a ton compared with the U. S. $50.

Iron, Scrap Shortages Loom

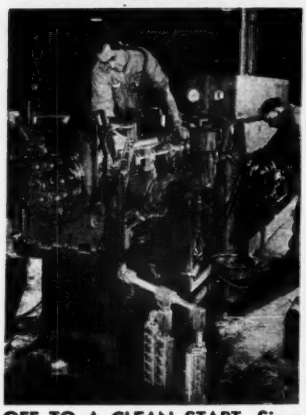
Shortages of pig iron and scrap again may confront the foundry industry if the government persists in licensing these materials for export. The situation is further complicated by a decline in pig iron production as a result of the steel strike.

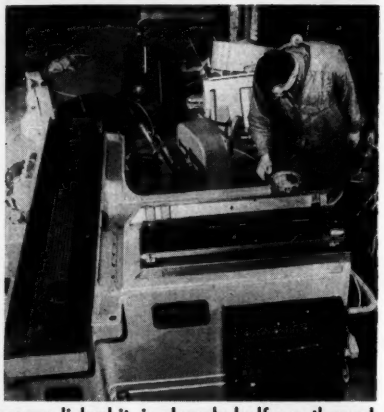
Cal C. Chambers, president, Malleable Founders Society, Cleveland, says "it seems a shortsighted policy for the government to assume that we can spare these metallics when the supply and demand are operating on a 'touch and go' basis."

Mr. Chambers told members of the society attending its annual meeting last week in Hot Springs, Va., that the government has licensed some raw materials for export and may be ready to authorize still more shipments.

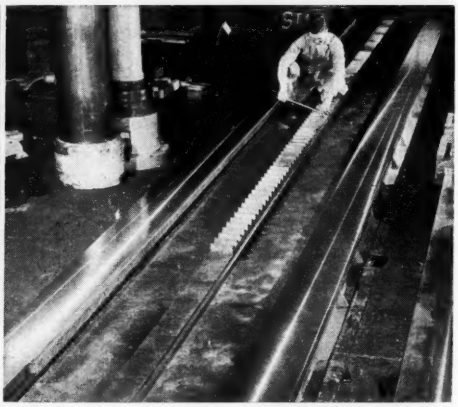
Frank D. Brisse, president, Laconia Malleable Iron Co., Laconia, N. H., was elected president, succeeding Mr. Chambers, president, Texas Foundries Inc., Lufkin, Tex. George T. Boli, president, Northern Malleable Iron Co., St. Paul, was elected vice president.

Rebuilding Machine Tools Is Also a Big Job; Here's How It's Done

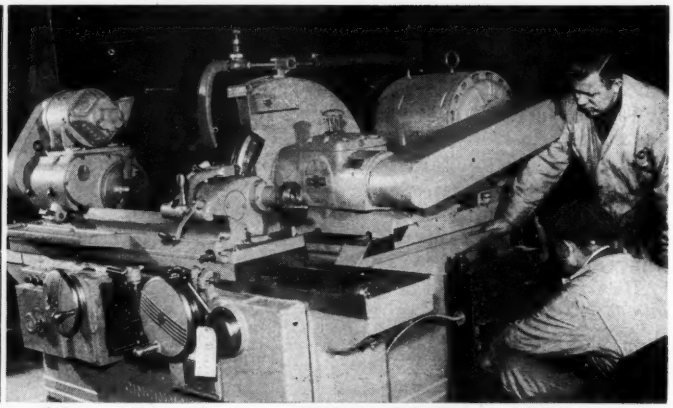




OFF TO A CLEAN START, Simmons Machine Tool Corp., Albany, N.Y., one of several companies selected to put into running condition government-owned machine tools that were mothballed after World War II, removes grease and grime (left) before rebuilding . . . SPEED was the big problem. Simmons licked it, is already halfway through its part of the reactivation program: It completed over 400 tools (center) . . . FINISHING TOUCHES are applied (right) after a sandblasting operation; machine's castings get several coats of a special protective finish



HEAT TREATING for strength and hardness is often necessary, and, where a replacement part cannot be purchased, a new part is machined, heat treated and finish ground within the Simmons plant (left). Reactivation consists of cleaning, replacing worn or broken parts, correcting tangled wiring, inspecting. SEVENTEEN TONS is what 42-foot-long steel weldment adds up to (right); it is the bed for a huge pit lathe. Simmons not only rough-planed the ways, it finish-planed the bed and then finish-ground the job to a tolerance of 0.002 of an inch



THE FINAL TEST: A Simmons service engineer (left) tests a reactivated Landis grinder. When necessary a Simmons man will supervise installation and initial operation of machines. Some of the more well-preserved machine tools require considerably less "reactivating" than others . . . TESTING ELECTRICAL PARTS is an important part of engineered rebuilding. Two Simmons men (right) check a control panel on a reactivated Cincinnati grinder. Other tools reactivated include millers, planers, special ordnance-application machines

Nickel: Where Our Allocation of Free World Supply Goes

Heavy military demands scotch hope for early decontrol. Supply-demand balance by 1955

HOW MUCH: International Materials Conference allotted the U.S. 52,306,781 pounds during the current quarter, 67.9 per cent of the free world total output.

WHERE IT GOES:

ARMED FORCES AND ATOMIC ENERGY COMMISSION — **70%**

CAPITAL GOODS FOR DEFENSE AND CIVIL WELFARE (tools, dies, power equipment) — **22%**

AUTOMOBILES AND OTHER CONSUMER DURABLES — **8%**

WHY: One ton of jet alloy contains enough nickel to produce 9 or 10 tons of stainless steel. Inconel contains enough nickel per ton to produce 14.5 tons of stainless steel.

DON'T LOOK for more nickel in consumer durables and capital goods in the near future. The situation probably will grow even worse before it gets better, F. F. Franklin, assistant chief, Ferroalloys Branch, Iron and Steel Division, NPA, advises STEEL.

Easing copper, steel and aluminum supplies fostered wishful rumors to the effect that there will be plenty of the shiny metal in two or three months. Actually, as other metals become more easily available, the demand for nickel grows tighter because of the increased production of goods.

Demand—Nickel is used in the civilian economy in stainless steel, alloy steel and alloy cast iron. In nonferrous metals it finds a place wherever resistance to corrosion, heat or electricity are needed. It is used in plating itself and as flashing and undercoating to make possible plating with chromium and other metals. It acts as a catalyst in chemical reactions.

To this widespread use throughout the civilian economy are added defense production uses which require a high percentage of nickel for alloys—a hike from negligibility to 70 per cent of the total consumption. (See chart.) There just isn't enough nickel.

Supply—The United States produces very little nickel now—about 150,000 pounds a month as a by-product of copper production—but we normally use 15 or 16 million pounds per month. Nearly all of the amount comes from Canada.

The problem of short supply exists throughout the free world. To prevent competitive buying among our allies, the International Materials Conference was called to allocate the metal. Our share was 50,598,400 pounds the first quarter of this year and much of that was not delivered until April. Working inventories are now only 8 million pounds (two weeks supply) against 20 million pounds prior to Korea.

Solution—Reduction in requirements for nickel or a substantial increase in the supply could solve the problem. There is very little likelihood of the former. The national stockpile is still purchasing nickel and doubtlessly would absorb any surplus made available by reduction in industry demand.

So the answer is increasing the supply—and that's going to take time. Gaining steam is a four-year nickel expansion program to boost annual nickel output in the free world by 47,600 tons—about one-third above the pre-Korea supply. Jess Larson, General Services administrator, figures the supply-demand balance will come in 1955.

Nebulous—NPA's metal allocators aren't so definite about the happy ending. They confine themselves to observing that relaxation of nickel controls in the near future "is not even remotely possible"—that means through 1953.

However far the program goes by 1955, the U.S. is in line for a bigger share of the free world's supply than its present two-thirds take. Long-term contracts with cash advances are being offered Canadian producers to encourage expansion. National Lead Co. and Sherritt-Gordon Mines Ltd., a Canadian copper company, were brought into the nickel business. National Lead, an American firm, gets an added stimulant: Rapid tax write-off privileges. M. A. Hanna Co. is researching processes and designing a plant to produce 9000 tons of nickel a year by 1954.

Fertile Back Yard—International Nickel Co. is negotiating to acquire 5000 acres of nickel and copper bearing land near Ely in northeastern Minnesota. The firm plans the area's first nickel and copper mine. There are undeveloped deposits in Washington and Oregon that could feel the shovel soon.

If all the conjectures materialize, our supply might be increased very substantially—enough to permit some reduction of controls and limitations. But that may take three or four years, and in the meantime, the demand for nickel continues to increase faster than production.

2 ways to ease your Steel Shortage

1 Collect all dormant Steel Scrap and get it to the steel producers

Millions of tons of valuable scrap still lie idle in America. Scrap salvage means more production—a stronger America. Clean out your plant . . . sell all your iron and steel scrap to your local scrap dealer now. The need is urgent. Every bit will help to meet the needs of defense production.

KEEP IT MOVING

It's your SCRAP that makes your STEEL

TO YOUR SCRAP DEALER

2 Make your steel supply go farther —specify N-A-X HIGH-TENSILE STEEL

Users of N-A-X HIGH-TENSILE steel find they can make 3 tons do the work of 4. Through its high strength and corrosion-resistant properties, lighter sections can be used without sacrifice of quality. It fabricates and welds with the ease of mild carbon steel. Let us assist you in applying this economy to your products.

MAKE A TON OF SHEET STEEL GO FARTHER Specify— N-A-X HIGH-TENSILE STEEL

... And "MAKE YOUR PRODUCT LAST LONGER"

GREAT LAKES STEEL CORPORATION

N-A-X Alloy Division — Ecorse, Detroit 29, Mich.

NATIONAL STEEL CORPORATION

NATIONAL STEEL

By H. C. TUTTLE *Detroit Editor*

Mirrors of Motordom

The auto industry, after weighing effects of steel strike and considering conflicting trends in demand, still has a hunch cars will be in short supply at year's end

DETROIT

SALES ANALYSTS of automakers are trying to piece together a forecast of passenger car demand which will take into account all the factors. They have to predetermine the effect of the steel strike on future buying, the actual strength of the market as measured among other things by the used car price trend, the upward movement of new car registration totals with its accompanying downtrend in field stocks, and other influences.

Factories Optimistic — Never have the factories shown as much concern over the public's relative apathy to car buying as the dealers have. The automakers by and large have held to the belief that passenger cars would be a short supply item before the year is over. There now appears for the first time to be concrete evidence that they may be right.

In many cases it is still possible to make good deals when buying certain makes of new cars. It is also, however, possible to be placed on a waiting list if you are set on a particular model or color. Dealers are being exhorted by their factories to brush up on salesmanship, but at the same time the factories are striving to get production ceilings lifted and controls on materials removed.

There are other paradoxes. Luxury attachments, such as automatic headlight dimmers and power steering, are in strong demand; more expensive body styles, notably the hardtop convertible and four-door models, are big sellers. Simultaneously, however, the public, as it makes its complaints known, gripes about the high cost of automobiles—probably saying more on this subject than on any other single item which it may be tempted to buy.

Puzzle—No manufacturer knows quite how to figure it. Some have decided that the public is after transportation at the lowest possible cost and are giving this with low gas consumption, low purchase price cars. Others believe that elimination of extra expense frills will lure buyers. Still others find that economy in operation and in purchase price are not the principal wants. One thing generally agreed upon is that styling has to be good.

This particular reason more than any other seems to be behind the early model change scheduled for two of the big three. On one other point there is no argument: Selling has to take the place of order taking.

Rough Road—If, as has been suggested by the National Automobile Dealers Association, the retail end of the automobile business can be used effectively as a yardstick to measure the economic health of the nation as a whole, the economy was feeling queasy in the first quarter. Every fourth new car dealer operated in the red, and among the small dealers — those selling less than 150 new cars a year—one out of every three was operating on the debit side of the ledger. Over 80 per cent of the dealer total is in the "small" category. Average profit for the new car dealers in this three-month period was 2½ per cent of sales after taxes. NADA's survey, of course, predates the normal spring buying upturn and also the removal of Regulation W. But, while admitting to the possibility of some improvement in the situation since first quarter, the association dolefully says that no marked improvement in dealer profits can be predicted.

Damaging—The steel strike has gone on too long not to have a disruptive effect on car and truck production. Just how drastic cannot be known in advance. A month's production was about the best that automakers could see when they studied their own stocks and quizzed their suppliers when the strike began June 2. Some at that time were counting heavily on getting material from mills still operating.

In order to keep their assembly lines from faltering, some makers have stopped replacement parts production, and nearly all are having to rob Peter to pay Paul, borrowing against a larger stock of a particular item to help out some other operation or some supplier whose inventory has reached the danger zone.

Auto, Truck Output

U. S. and Canada

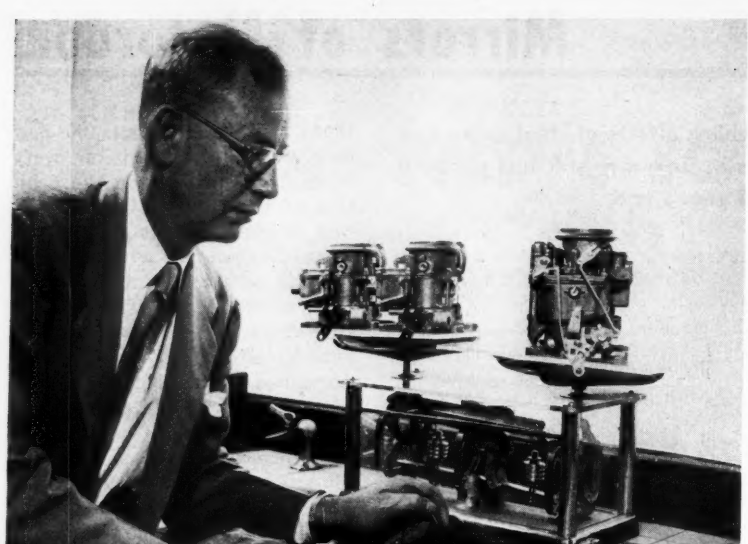
	1952	1951
January	409,406	645,688
February	467,692	658,918
March	517,206	792,550
April	576,504	680,281
May	542,075*	695,898
June		653,682
July		522,858
August		571,442
September		505,758
October		558,971
November		480,199
December		402,729
Total		7,179,161
Week Ended	**1952**	**1951**
May 17	129,914	156,127
May 24	127,723	158,259
May 31	104,892	121,476
June 7	128,807	152,656
June 14	131,287	157,026
June 21	125,000*	158,909

Sources: Automotive Manufacturers Association, Ward's Automotive Reports. *Preliminary.

Crucial Week Approaches

The first week of July will be crucial for most automakers: A few may curtail in the week beginning today unless steel production is resumed immediately. The empty, or near-empty, storage racks and receiving departments will almost certainly prevent the July output pace from matching June production. And the carryover tonnage which mills will have on their books when they resume operation indicates that automakers' third and fourth quarter production schedules will be de-

(Material in this department is protected by copyright and its use in any form without permission is prohibited)



Debut on DeSoto

Two of DeSoto's new, lightweight carburetors weigh less than one of the larger type they replace. Thomas M. Ball, head of Chrysler Corp.'s Engineering Division Laboratories (he was principally responsible for design and development of the new carburetor) adjusts a balance scale to show weight difference between the two types. New weight is 3.6 pounds compared with 7.4 pounds for the earlier model. The cast aluminum carburetors save over an inch vertically, maintain same fuel, air and throttle sizes. Use: On Fire Dome V-8 engines.

pressed. One effect of the strike may be to move back the model changeover timetable where scheduled for summer or early fall. Making up the production loss will become more important than getting out a new design.

Defense Work Suffers Most

In the auto industry the steel strike is hitting some defense work harder and sooner than civilian output. One reason is that the steels required have never been off the short list. Oldsmobile at Lansing and Ford at Highland Park expect to have to cease 3.5-inch rocket manufacture this week because of lack of seamless tubing. Olds figures to close this operation today and Ford sets its shutdown for two days later. Dodge Division of Chrysler will suspend its military truck output on June 25 when it runs out of wheels. Made of heavier gage steel than the wheels on its civilian vehicles and of entirely different design, the military wheels come from a different source than the commercial model and are not interchangeable.

Aluminum Crowds Zinc

Just as aluminum has some of the copper fabricators jumpy because of its potential for making inroads as a radiator and wiring material, so it now gives indication that it may take over some die-cast zinc applications. The engineering division of Chrysler Corp. has developed a new dual-barreled carburetor using die-cast aluminum in place of zinc for its body. Weight was cut more than 50 per cent by the change, but this is not a principal reason for the new model's adoption. The redesign was dictated by the need for a unit which would permit the entrance of the same amount of air but would not require the vertical room between hood and top of engine. An alternative to the design settled upon would have been to adopt an offset type of air-cleaner and silencer instead of a top-mounted unit, but this, it was said, might restrict air passage into the carburetor. The redesign permitted a reduction of over an inch in height of the carburetor and air cleaner. In over-all size the carburetor is now much smaller and lighter, but the interior fuel and air passages and throttle parts remain at their former size.

Victory for Kaiser

Henry J. Kaiser and the companies with which he is associated won a major victory last week on Capitol Hill. They had the pleasure of learning that Mr. Kaiser's sworn refutation of charges made against him and them by Rep. Alvin E. O'Konski (Rep., Wis.) would become a part of the *Congressional Record*. This refutation was placed there by Mr. O'Konski who inserted it with these remarks: "Unless information to the contrary is supplied to me, I am entirely satisfied that Mr. Kaiser's reply completely refutes every one of the charges I inserted in the *Record* on May 21. If any contrary information is supplied to me or any of my colleagues, I sincerely believe that to serve any useful purpose it must be given under oath. That is the only fair approach and one that would be consistent with the complete integrity displayed by Mr. Kaiser in this matter."

Mr. Kaiser informs Congressman O'Konski that the charges supplied him by a "group of selfish interests ruthlessly conspiring to cripple the Kaiser enterprises and ruthlessly bent on preventing the manufacture of airplanes by Kaiser-Frazer" were distortions and falsehoods "from start to finish." He tells the congressman that these people "misled and misused you in order to escape swift and sure retribution in a court of law for their malicious slanders."

Keeping the Public Posted

A little knowledge is a good thing. This is the view taken by General Motors and Ford in issuing respectively a booklet and a film with broad educational appeal. General Motors' booklet, entitled "Precision—A Measure of Progress," traces the development of measuring devices from Noah's day to the present—and beyond. Ford's movie "Tomorrow Meets Today" puts the company's engineering and research activities on display to show how new cars are styled, built and tested before mass production begins.

here's Latrobe's three-fold answer to your die production problems...

QUALITY CONTROL

Throughout the entire manufacturing process, the quality of "DESEGATIZED" Hi Carbon-Hi Chromium Die steels is constantly controlled. From initial chemical analysis to final inspection of finished product—test after test, after test. That is why the user of these, the very finest die steels, is guaranteed

- ease of die fabrication
- minimum heat treat hazard
- extra toughness
- superior die performance.

WAREHOUSE DELIVERY

Latrobe maintains warehouse stocks of "DESEGATIZED" Hi Carbon-Hi Chromium die steels at these nine strategic locations:

- Chicago
- Cleveland
- Dayton
- Detroit
- Hartford
- Los Angeles
- Philadelphia
- Toledo
- Latrobe (mill)

Daily teletype connections—warehouse to mill and warehouse to warehouse—make each of these your local warehouse. Toll calls are accepted free of charge from many other adjacent points (consult the yellow pages of your telephone directory).

TECHNICAL SERVICE

Latrobe's metallurgical laboratory, completely modern, is staffed by technicians experienced in both the metallurgy and the application of die steels. These men can be of great assistance in the solution of production problems through

- Laboratory research into better steels
- Metallurgical analysis of die failures
- Disc inspection service
- Field service—selection of steels, proper equipment for working and heat treating assistance.

Production economy demands the best die performance! Select the best die steel for your next job—one of the "DESEGATIZED" Hi Carbon-Hi Chromium die steels!

SEND FOR THIS BOOKLET TODAY !

LATROBE STEEL COMPANY,
LATROBE, PA.

Please send me your folder regarding the "Selection and Use of DESEGATIZED High Carbon—High Chromium Die Steels".

NAME .....

POSITION .....

COMPANY .....

STREET .....

CITY..... ZONE..... STATE.....

LATROBE STEEL COMPANY

Formerly LATROBE ELECTRIC STEEL COMPANY

LATROBE, PENNSYLVANIA

Branch Office and Warehouses: BOSTON, BUFFALO, CHICAGO, CLEVELAND, DAYTON, DETROIT, HARTFORD, LOS ANGELES, MILWAUKEE, NEW YORK, PHILADELPHIA, PITTSBURGH, ST. LOUIS, TOLEDO.

Sales Agents: DALLAS, DENVER, HOUSTON, MINNEAPOLIS, SALT LAKE CITY, SEATTLE, WICHITA.

EFFICIENCY EXPERT!
Want extra production space from your present plant?
Want to save purchasing time and paperwork?
I can help you!
Salary: Not a cent!
Write Box X.

Imagine adding his talents without adding to your payroll !

Did you ever think of the industrial distributor as an efficiency expert whose services don't cost you a cent?

He adds to your production space by making his warehouse your storeroom. He's a local source of supply for most of the things you need . . . and as near as your telephone.

He saves you purchasing time and paperwork because when you deal with him, you don't have to bother with many different suppliers. His knowledge of products and engineering techniques, both tried and new, is yours for the asking . . . from suggestions on substitutes for scarce items to emergency aid in supplying a vital part or piece of information to keep production running smoothly. If anyone can get hard-to-get items, he can . . . through his close contacts with manufacturers and other wholesalers.

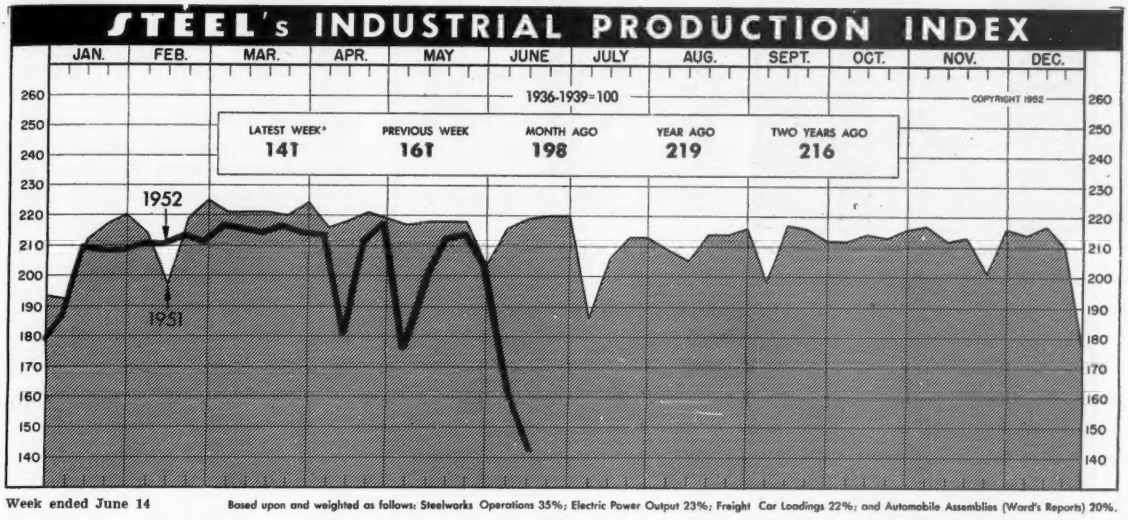
Your industrial distributor is in business to service your business. You'll find it profitable to use his services.

RUSSELL, BURDSALL & WARD BOLT AND NUT COMPANY

RB&W
THE COMPLETE QUALITY LINE

Plants at: Port Chester, N. Y., Coraopolis, Pa., Rock Falls, Ill., Los Angeles, Calif. Additional sales offices at: Philadelphia, Detroit, Chicago, Dallas, Oakland. Sales agents at: Portland, Seattle. Distributors from coast to coast.

107 YEARS MAKING STRONG THE THINGS THAT MAKE AMERICA STRONG


STEEL's INDUSTRIAL PRODUCTION INDEX
JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.
1936-1939=100
COPYRIGHT 1952
LATEST WEEK* 141
PREVIOUS WEEK 161
MONTH AGO 198
YEAR AGO 219
TWO YEARS AGO 216
1952
1951
260 250 240 230 220 210 200 190 180 170 160 150 140

Week ended June 14 — Based upon and weighted as follows: Steelworks Operations 35%; Electric Power Output 23%; Freight Car Loadings 22%; and Automobile Assemblies (Ward's Reports) 20%.

Many metalworking companies with uneven steel inventories soon will face severe production cutbacks. Industrial activity index plunges downward as result of steel strike

MOST ASSEMBLY lines moved at steady rates during the first three weeks in June despite the turnoff in steel production.

Slowdowns — That's because many metalworking companies had stashed away sizable amounts of steel and other materials before the steel strike. Indicative of such preparations are manufacturers' inventories. They climbed to $42,500 million in April, estimates the President's Council of Economic Advisors. That's a new record for the month. The April figure exceeds the March total by $264 million. But we may see production slowdowns from now on.

While industrial stockpiles are unusually high, inventories are uneven. More and more manufacturers are near scraping the bottom of the barrel for certain steel specifications. And it would take the nation's steel mills about ten days after resumption of operations to return to full production.

Index—As steel production continued to fall off, STEEL's industrial activity index plunged sharply to 141 per cent of the 1936-1939 average in the week ended June 14. That's 20 percentage points under the previous week and 72 points under the reading for the week ended May 24, the last full workweek before the onset of the third walkout. Steel production in the week ended June 7 declined to 13 per cent of capacity from 37.5 per cent in the previous week. Following the drop in steel output, electric power generation and freight car loadings continued to decline. On the other hand, automotive production edged upward from output in the previous week.

Autos Steady . . .

Even though the steel strike has forced the auto industry to eat heavily into inventories, production of cars and trucks is remaining at high levels. This high output is expected to continue until nearly the end of the month when inventories will have dropped to critical levels. At present, a boom in dealers' sales is causing the industry to get as many passenger cars into the field as soon as possible.

On June 16, the U. S. auto industry assembled its 2 millionth passenger car of the year. On the same day in 1951, the industry had assembled 2.9 million passenger cars.

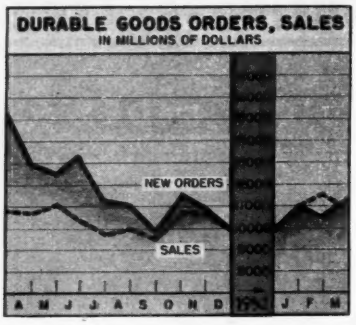
In the week ended June 14, U. S. and Canadian plants turned out 131,287 autos and trucks, estimates *Ward's Automotive Reports*. That's a rise of 2400 units over auto-truck output in the previous week and 25,739 autos and trucks under production in the same week in 1951, when the two nations assembled 157,026 autos and trucks. In the first five months of 1952, U. S. and Canada produced 2,516,171 units, compared with an auto-truck output of 3,487,542 units during the same months in 1951.

Steel Output Slashed . . .

While the steelworkers were on their third walkout of the year and steel talks came to an impasse in Washington, the nation's mills produced only 255,000 net tons ingots and steel for castings in the week ended June 21, the American Iron & Steel Institute estimates. That's 1 million net tons under the previous week but 1,879,000 net tons under production in the same week in May, when the industry turned out 2,134,000 net tons ingots and steel for castings.

Business Weather Poor . . .

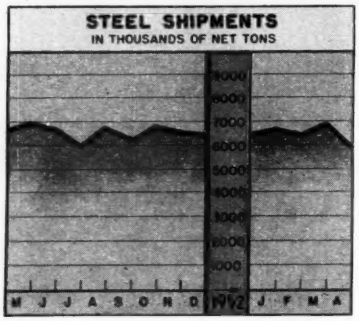
Business conditions in May were on the downgrade, says Purchas-



Durable Goods Orders, Sales
In Millions of Dollars

	New Orders		Sales*	
	1952	1951	1952	1951
Jan.	11,068	15,050	10,970	10,430
Feb.	10,672	13,474	11,553	10,390
Mar.	11,375	15,542	10,770	10,851
Apr.	.....	12,987	.....	10,739
May	.....	12,404	.....	11,150
June	.....	13,303	.....	10,383
July	.....	11,274	.....	9,741
Aug.	.....	11,046	.....	10,052
Sept.	.....	9,880	.....	9,559
Oct.	.....	11,584	.....	10,700
Nov.	.....	11,090	.....	10,753
Dec.	.....	9,941	.....	9,854

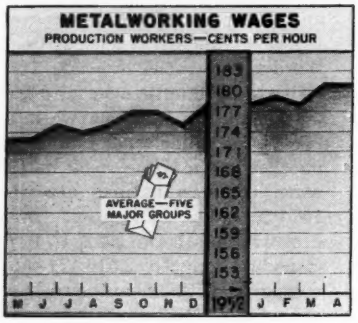
*Seasonally adjusted. U. S. Office of Business Economics.



Steel Shipments
Net Tons

	1952	1951	1950
Jan.	6,589,193	6,904,688	5,482,691
Feb.	6,358,293	5,776,229	5,134,780
Mar.	6,890,391	7,105,078	5,723,340
Apr.	5,922,000	6,634,510	5,780,453
May	.....	6,938,708	6,252,672
June	.....	6,645,897	6,192,438
July	.....	5,988,574	5,668,898
Aug.	.....	6,755,589	6,326,464
Sept	.....	6,207,491	6,145,354
Oct.	.....	6,844,093	6,503,531
Nov.	.....	6,509,048	6,051,145
Dec.	.....	6,411,105	6,432,776

American Iron & Steel Institute

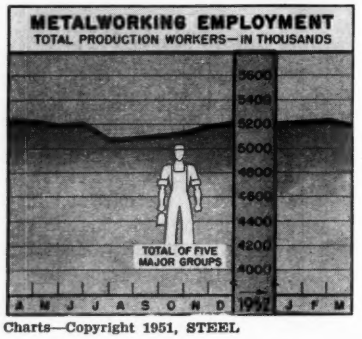


Metalworking Hourly Wages
(cents)

Production Workers—Five Major Groups

1951	Prim. Mtls.	Fab. Prod.	Mach- inery	Elec. Mchy.	Trans- Equip.
Apr.	179.8	165.5	174.9	160.4	182.9
May	179.9	165.5	175.0	161.8	183.3
June	181.9	166.1	176.2	163.7	186.0
July	181.9	165.8	175.4	162.6	186.3
Aug.	180.2	166.3	176.6	164.0	186.7
Sept.	183.5	168.2	178.8	164.5	188.4
Oct.	181.6	168.8	179.4	164.9	188.5
Nov.	181.9	168.9	170.7	165.5	189.2
Dec.	183.6	170.0	181.7	167.0	190.3
1952					
Jan.	184.7	170.3	182.0	166.9	191.4
Feb.	183.1	170.5	183.0	166.8	190.3
Mar.	184.8	171.5	184.1	169.5	193.4
Apr.	184.1	172.1	183.6	169.9	194.7

U. S. Bureau of Labor Statistics



Metalworking Employment
In Thousands

Production Workers—Five Major Groups

1951	Prim. Mtls.	Fab. Prod.	Mach- inery	Elec. Mchy.	Trans. Equip.
Mar.	1,159	858	1,231	724	1,253
Apr.	1,161	859	1,239	718	1,243
May	1,162	850	1,242	707	1,233
June	1,172	843	1,252	704	1,237
July	1,155	813	1,235	684	1,187
Aug.	1,165	816	1,211	695	1,197
Sept.	1,159	811	1,219	709	1,210
Oct.	1,160	809	1,242	707	1,205
Nov.	1,151	804	1,255	717	1,242
Dec.	1,165	806	1,270	724	1,238
1952					
Jan.	1,163	804	1,276	723	1,240
Feb.	1,160	805	1,280	726	1,243
Mar.	1,154	803	1,268	719	1,239

U. S. Bureau of Labor Statistics

Charts—Copyright 1951, STEEL

Issue Dates on other FACTS and FIGURES Published by STEEL

Construction .....June 9	Indus. Production..May 26	Ranges, Elec. .....June 16
Employ., Steel ....Apr. 28	Ironers .....May 12	Ranges, Gas .....June 16
Fab. Struc. Steel ..June 9	Machine Tools .....June 2	Refrigerators .....June 16
Freight Cars .....May 26	Malleable Castings.June 2	Steel Castings ....June 2
Foundry Equip. ...June 9	Prices, Consumer...May 19	Steel Forgings .....June 9
Furnaces, Indus. ..May 26	Prices, Wholesale...May 19	Vacuum Cleaners ..May 5
Gear Sales .....May 26	Pumps .....May 12	Washers .....May 12
Gray Iron Castings.June 2	Radio, TV .....June 16	Water Heaters .....May 19

ing Agents Association of Chicago after a member survey. Production took the first definite drop since December, with 26 per cent of the association's members reporting lower output, compared with 16 per cent reporting step-ups. Employment in May started down grade as 17 per cent of the members reported fewer employees and only 8 per cent reported increased employment. Members' inventories also continued to drift downward while prices of principal items remained about the same. The association says May deliveries by vendors were satisfactory and may have reached a point where they cannot improve much further. As to buying policy, 48 per cent of the member purchasing agents ordered within a 30-60 day range ahead of production; 28 per cent, within a 0-30 days; and 20 per cent, within the 60-90 day bracket. Only 4 per cent ordered 90 or more days in advance.

Retail Sales Lift . . .

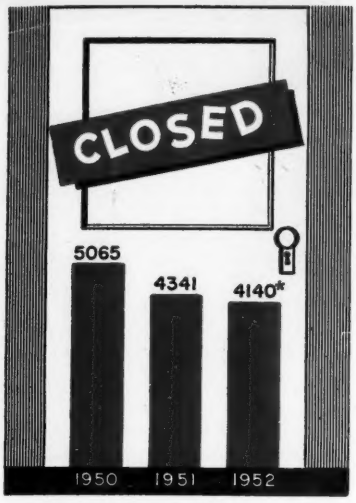
Department store sales in May increased for the first time since November, 1951, says the Federal Reserve Board. The board's seasonally adjusted index of store sales for May is estimated at 107 per cent of the 1947-1949 average. This increase is 4 percentage points above the April reading and 3 points above the index for May, 1951.

Range Shipments Lag . . .

Shipments of domestic gas ranges dropped to 161,100 units in May, a decline of 12,500 units from range shipments in April, says Gas Appliance Manufacturers Association. Industry shipments of gas ranges during the first five months of 1952 reached 852,200 units, compared with 1,207,200 units shipped in the same months of 1951.

First Building Decline . . .

Construction awards took their first substantial decline of the season in the week ended June 12. Contract awards for heavy construction that week totaled $243.9 million, under the average 1952 week to date by 4 per cent, says the *Engineering News-Record*. In-



Mortalities Decline

Industrial and commercial business failures for the first six months of the last three years show a steady decline

*Estimated

dustrial building awards declined 6 per cent from the average to $51.8 million, while private housing declined 18 per cent under the average to $46.6 million.

Prices Edge Upward . . .

Average market prices reversed their downdrift and moved up 0.2 per cent to 111.7 per cent of the 1947-1949 average in the week ended June 10, says the Labor Department. Primary market prices that week were 1 per cent above the May average and 2.9 per cent under the average for January, 1951.

All commodities other than farm and foods totaled 112.4 per cent (1947-1949=100). That's 1 per cent above the May average and 3.6 per cent under prices during January, 1951.

Trends Fore and Aft . . .

Bank debits in May were up 3 per cent from the year-ago total . . . Car loadings in the week ended June 7 were 15.9 per cent under the corresponding 1951 week . . . Shutdown in steel companies' captive coal mines lowered weekly bituminous output about 16 per cent between May 24 and June 7 . . . Our national debt jumped up over the $260 billion mark in the week ended June 14. . . Television sales of the Admiral Corp. on a unit basis were 24 per cent higher in May than in the like 1951 month, says Wallace Johnson, president. Inventories of Admiral dealers dropped to the lowest level in 12 months. . . . Factory sales of mechanical stokers in April totaled 1195 units, under the year-ago sales of 1353 units by 12 per cent.

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Output (per cent of capacity)[2]	13.0	37.5	103.0
Electric Power Distributed (million kwhr)	7,126	7,005	6,747
Bituminous Coal Output (daily av.—1000 tons)	1,250	1,398	1,628
Petroleum Production (daily av.—1000 bbl)	6,000[3]	6,081	6,189
Construction Volume (ENR—millions)	$243.9	$225.9	$206.9
Automobile, Truck Output (Ward's—units)	131,287	128,807	157,026
TRADE			
Freight Car Loadings (unit—1000 cars)	680	684	826
Business Failures (Dun & Bradstreet, number)	175	120	130
Currency in Circulation (millions)[3]	$28,830	$28,842	$27,499
Dept. Store Sales (changes from year ago)[3]	+2%	+2%	+1%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$15,119	$15,065	$14,776
Federal Gross Debt (billions)	$260.2	$259.9	$254.6
Bond Volume, NYSE (millions)	$18.5	$14.5	$13.3
Stocks Sales, NYSE (thousands of shares)	6,177	6,266	6,165
Loans and Investments (billions)[4]	$73.7	$73.8	$69.0
United States Gov't. Obligations Held (billions)[4]	$31.9	$31.7	$30.2
PRICES			
STEEL's Weighted Finished Steel Price Index[5]	171.92	171.92	171.92
STEEL's Nonferrous Metal Price Index[6]	223.7	223.7	242.3
All Commodities[7]	111.7	111.5	115.0
All Commodities Other Than Farm and Foods[7]	112.4	112.4	116.6

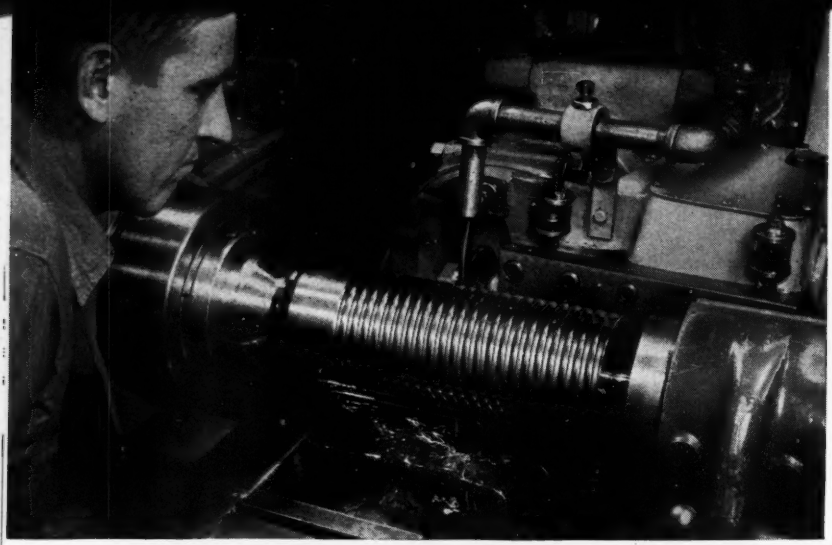
*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1951, 1,999,035; 1952, 2,077,040. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System [5]1935-1939=100. [6]1936-1939=100. [7]Bureau of Labor Statistics Index, 1947-1949=100.

L & J Reamers have a Wider Range of Standard Sizes

Large Sizes
TO 1½"

Small Sizes
TO .040

The Reamer Specialists
LAVALLEE & IDE, INC.
CHICOPEE, MASS.



THREAD MILLING A SCREW. Metal: SAE 2345 steel heat-treated to 28 Rockwell • Machine: Lees Bradner thread miller • Part: 5¼" adjusting screw for press brake • Operations: rough and finish thread milling Tool: high-speed steel • Feed: 0.260 depth on roughing Cutting Oil: Sunicut 105

BROACHING A GEAR KEY-WAY. Metal: SAE 2345 steel forging 220 Brinnell • Machine: 3L8 La Pointe hydraulic broach • Part: gears for shaper, produced two at a time • Tool: 3′ high-speed steel broach • Cutting Oil: Sunicut 105

SUNICUT 105 REPLACES THREE OILS AND SOLVES FIVE MAJOR PROBLEMS

Buying three cutting oils and then blending them to make additional grades had proved highly unsatisfactory to a machine tool builder. The smoke was noxious, employees complained of skin irritations, the color of the oils made it difficult to see the work, tool life was short and finishes not up to standard. To help solve these problems, the company called in a Sun representative and on his advice tested Sunicut 105 on the three tough jobs pictured here.

So good were the results that the company adopted Sunicut 105 for every machine in the plant and has used it exclusively for the past two years. The operators like its transparency. There are no complaints about smoke or skin irritations. Finishes have improved and tool life increased as much as 50 percent.

For complete information on Sun's cutting oils, write to Department S-6 and we will send you a copy of our informative, illustrated booklet "Cutting and Grinding Facts."

CUTTING A LARGE GEAR. Metal: bronze 180 Brinnell • Machine: Gould & Eberhardt gear hobbing machine • Part: main drive worm gear wheel for large shear • 42⅝" O. D.; 5" thick; 87 teeth • Tool: high-speed steel hob • Feed: 0.006 • Speed: 42 rpm • Cutting Oil: Sunicut 105

SUN INDUSTRIAL PRODUCTS

SUN OIL COMPANY, PHILADELPHIA 3, PA. • SUN OIL COMPANY, LTD., TORONTO AND MONTREAL

SUNOCO®

WILLIAM L. SHANK
. . . a V. P. of Ingersoll Milling Machine

R. D. OLDFIELD JR.
. . . Ohio Screw Products sales mgr.

CHARLES A. CARRITHERS JR.
. . . gen. mgr. at Hodell Chain

William L. Shank, since 1951 an assistant to the president of **Ingersoll Milling Machine Co.,** Rockford, Ill., was elected a vice president. He formerly had been with General Steel Castings Corp.

W. A. McKinley was elected president, **Midland Steel Products Co.,** Cleveland, succeeding the late **E. J. Kulas.** With Midland 27 years, Mr. McKinley was executive vice presi-president. **L. J. Fralick** becomes vice president of sales.

David Rozet joined **Weldwire Co.,** Philadelphia, as vice president and director of research. He was employed for more than nine years by Arcos Corp.

Abe M. Luntz was named president and treasurer and **William Goldsmith** executive vice president and secretary of **Luntz Iron & Steel Co.,** Canton, O.

Whitehead & Kales Co., Detroit, appointed **Crosby Wyman** director of purchases, and **C. Wesley Hadley** as purchasing agent.

W. J. Webb, director of sales, **Evinrude Motors Division,** Outboard Marine & Mfg. Co., Milwaukee, was advanced to general manager of the division.

W. D. Levie, production superintendent of the St. Paul coke plant, **Koppers Co. Inc.,** was appointed technical adviser to A. W. Lundquist, plant manager. **Jess H. Brown** succeeds Mr. Levie.

R. D. Oldfield Jr. was appointed sales manager, **Ohio Screw Products Inc.,** Elyria, O. He was previously with Johnson Bronze Co., New Castle, Pa.

Northwestern Steel & Wire Co., Sterling, Ill., appointed **W. W. Alexander** as manager of sales, industrial trade products.

George B. Clay was promoted from superintendent to sales manager, machine division, **Hobbs Mfg. Co.,** Worcester, Mass. **Philip A. Blair** was made assistant sales manager, fastener division.

Riverside Metal Co., Riverside, N. J., elected **M. W. Batchelor** president. Associated with the nonferrous metal industry for more than 25 years, he has served with Revere Copper & Brass Co., was executive vice president of Bridgeport Brass Co. and manager of the Cleveland mill of Chase Brass & Copper Co.

Otto Schroeder was named general production manager, **Soule Steel Co.,** in charge of company plants. His headquarters will be in San Francisco.

George A. Zink was appointed general manager, Fabricast Division, Bedford, Ind., **General Motors Corp.**

Louis S. Deris was appointed vice president-sales, switchboard and control division, **Mullenbach Electrical Mfg. Co.**

Charles A. Carrithers Jr., executive assistant, was named general manager, **Hodell Chain Co.,** division of National Screw & Mfg. Co., Cleveland. Other promotions include **Maxwell S. Reber,** divisional purchasing director, to assistant general manager, and **David J. Gemmell,** special assistant to the division's president, to director of sales. Mr. Reber continues in charge of purchasing.

Lockheed Aircraft Corp., Marietta, Ga., division, named **William Rieke** general purchasing agent, **Ralph Osborn** director of material, **Ben R. Haverstick** master scheduling manager, and **E. V. Gustafson** administrative engineer. **J. M. Wade Jr.** succeeds **Frank Johnson** as employment manager.

H. W. Bluethe, formerly advertising manager, Wheelco Instruments Co., joined **Lindberg Engineering Co.,** Chicago, as sales promotion manager.

Homer F. Donagher, vice president in charge of export, **Oliver Corp.,** Chicago, was appointed vice president and general sales manager of the company. He succeeds **Merle S. Tucker,** who, at his own request, was relieved for special assignment.

Arthur G. McKee & Co., Cleveland, announces appointments in its metals division: **A. L. Foell** becomes technical director, **Merrill Cox** general sales manager, **J. F.**

Baier chief engineer. **Ben B. Frost** was appointed sales manager, iron and steel department.

F. S. Lourie, vice president-manufacturing, and **R. J. Williams,** vice president of development engineering, were elected directors of **American Metal Products Co.,** Detroit.

Melvin S. Donaldson was elected vice president in charge of the West Coast operation, **A. M. Castle & Co.,** Chicago.

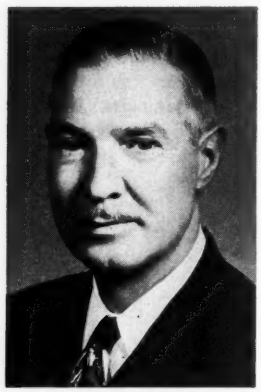
George L. Berry was appointed plant manager of the Welland, Ont., works of **North American Cyanamid Ltd.** succeeding **H. K. Booker,** who transfers to the New York office of Chemical Construction Corp.

Robert B. Bachman is now district manager of sales, Boston office, **Lukens Steel Co.** He succeeds **Edmund Pfeifer,** named district manager of sales, New York office.

John W. Lohnes becomes vice president of sales for **Jeffers Electronics and Spear Resistor Divisions,** Speer Carbon Co., St. Marys, Pa. He previously held that position for Speer Carbon and its International Graphite & Electrode Division, and now holds that office for the entire company.

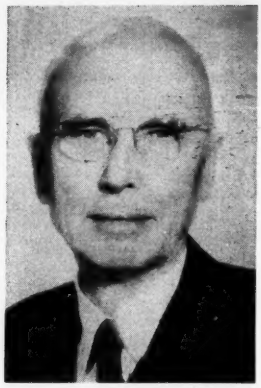
Fisher Body Division, General Motors Corp., announces that effective June 30, **A. T. Clausen** retires as manager of its Los Angeles plant. He will be replaced by **D. R. Larkin** who, since 1942, has been manager of the Pontiac, Mich., plant. **Carl W. Moyer** assumes that position.

D. R. LARKIN
. . . manages Fisher Body L. A. plant



CARL W. MOYER
. . . mgr. of Fisher's Pontiac plant

J. S. THOMPSON
. . . new V. P. of Townsend



H. E. CHILCOAT
. . . Townsend gen. sales mgr.

J. S. Thompson was appointed to the newly created position of vice president, **Townsend Co.,** New Brighton, Pa., with responsibility of maintaining contacts with customers, prospects and with industrial trade and professional groups. **H. E. Chilcoat** was appointed general sales manager to succeed Mr. Thompson.

Judge W. A. Kelly, head of the Stamford, Conn., law firm of Cummings & Lockwood, was elected treasurer of **Peabody Engineering Corp.,** New York.

Victor J. Pollock joined **Consolidated Engineering Corp.,** Pasadena, Calif., as assistant to the treasurer.

Universal-Cyclops Steel Corp., Bridgeville, Pa., elected **R. C. Rudolf** assistant secretary, **E. J. Reagan** manager of stainless bar and wire sales, **C. C. English Jr.** assistant district sales manager of the Dayton, O., branch, **Arthur Rowlands** sales repersentative in the Cleveland branch, **Arthur E. Jones** sales representative in the Philadelphia branch, and **Leslie F. Naulty Jr.** sales representative in the New York branch.

Pacific Airmotive Corp., Burbank, Calif., named **Charlotte De Armond** director of public relations and **J. T. Berger** of industrial relations.

Otis Elevator Co., New York, elected **Emmett W. Hines** general zone manager and a vice president. He succeeds **Arthur Lundeen** who retires. **John F. Lawson** succeeds Mr. Hines as general service manager.

Eugene S. Page was named special assistant to A. K. Brown, executive vice president, **American Machine & Foundry Co.,** New York. Before joining AMF he directed purchasing activities for Great Lakes Carbon Corp.

M. L. Johnson, Houston district credit manager, **National Supply Co.,** was promoted to division credit manager of the Gulf Coast division. He succeeds **Arthur L. Wallace,** resigned.

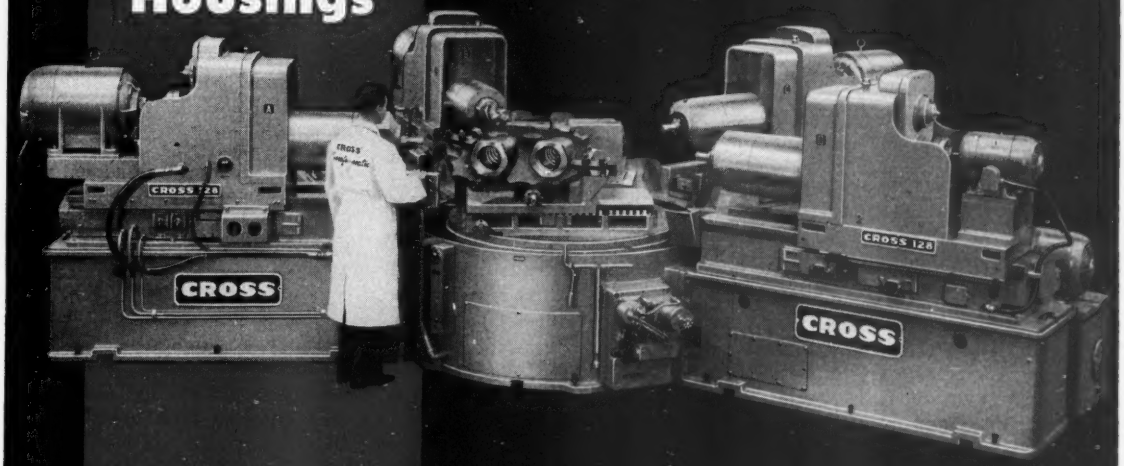
John D. Biggers, president of Libbey-Owens-Ford Glass Co., was elected a director of **Armco Steel Corp.,** Middletown, O.

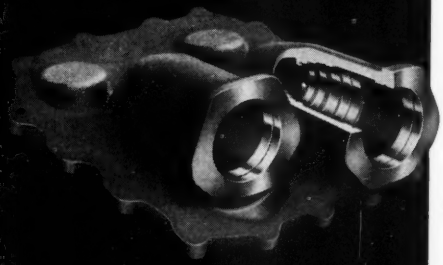
Victor F. Melin was elected secretary-treasurer, **Thor Corp.,** Chicago, to replace **R. J. Healy,** who left the company. Mr. Melin joined Thor in March after nine years with Avildsen Tools & Machines Inc., of which he was vice president and treasurer.

Thermador Corp., Los Angeles, appointed **Stanley Read** general man-

Bores Tank Suspension Support Housings

Another Special by Cross





- ★ Rough and semi-finish bore multi-diameter hole and form two snap ring grooves; index fixture and repeat operation for second bore.
- ★ Material—Cast Armor. Hardness—Rock. C42.
- ★ Six pieces per hour (three right and three left hand) at 100% efficiency.
- ★ 40 horsepower drive motor for each boring spindle.
- ★ Five-station, fluid motor operated, index table, including one station for loading, three for boring and one for grooving.
- ★ J.I.C. standard hydraulic and electrical construction with stranded wire.
- ★ Other features: Hardened and ground ways; hydraulic feed and rapid traverse; pre-set tools; automatic, gravity operated, cam clamping for index table.

Established 1898

THE CROSS CO.

DETROIT 7, MICHIGAN

Special MACHINE TOOLS

ager of its new Riverbank, Calif., ordnance plant. Other appointments: **Henry Butler,** assistant to the general manager; **Walter Locher,** director of industrial relations; **Richard Weaver,** plant engineer; **Earl Chamberlin,** general superintendent; and **William Graham,** purchasing agent.

George E. Prifold will head the LVT division, **Ingersoll Products Division,** Borg-Warner Corp., at Kalamazoo, Mich. He was with Pabco Products Inc.

Harold C. Eske becomes purchasing agent, **Hydraulic Tools Corp.,** Sheboygan, Wis.

Howard J. Scaife, San Francisco district manager, was named sales manager at Chicago for **Hotpoint Inc.** He is succeeded by **V. E. Koch.**

Midvale Co. appointed **Howard H. Casey** general sales manager for its Nicetown, Philadelphia plant.

William A. Dorff, most recently with Pneumatic Power Co., Cleveland, joined **Fischer & Associates,** consulting engineers, Cleveland, as executive vice president. **Henry M. Reese** was appointed sales director.

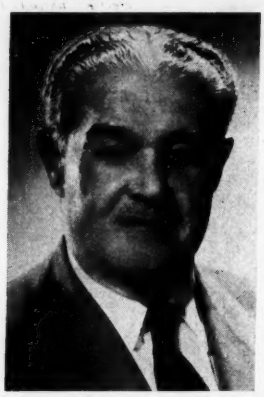
Michael J. Bozsin was appointed chief chemist, **Ferro Corp.,** Cleveland. He was promoted from process research engineer at the Cleveland plant.

EVAN C. DRESSEL
. . . retires from William B. Pollock Co.

Evan C. Dressel retired as sales manager of **William B. Pollock Co.,** Youngstown. As reported in STEEL, June 16, **Harold E. Halls** takes over as sales manager and **Emerson W. Morey Jr.** becomes assistant sales manager.

George C. Wilder was appointed a director to fill the unexpired term of the late **Jessel S. Whyte,** and was elected president of **Macwhyte Co.,** Kenosha, Wis. He was vice president and assistant general manager.

Harvey W. Bush, former plant manager, Rack Engineering Co., was appointed general manager, **Visual Production Planning Inc.,** Connellsville, Pa.



ERNEST E. KUGEL
. . . directs Hydropress sales

Hydropress Inc., New York, appointed **Ernest E. Kugel** director of sales in charge of rolling mills.

David B. Lawton was named manager of **General Electric Co.'s** newly planned transformer manufacturing plant at Rome, Ga. **John Anderson,** assistant secretary of GE, retired after almost 42 years of service.

H. M. Oshry was named vice president and director of **Crawfordsville Foundry Co.,** Crawfordsville, Ind.

Almo D. Squitero was appointed chief chemist, **Hanson-Van Winkle-Munning Co.,** Matawan, N. J. He succeeds **Dr. D. Gardner Foulke.**

OBITUARIES...

John C. Reed, 49, vice president, **American Radiator & Standard Sanitary Co.,** died June 14 in Louisville after an extended illness.

George W. Eppler, 55, general manager, Monongahela, Pa., Division, **Combustion Engineering - Superheater Inc.,** died June 8.

Allen L. Moore, 55, purchasing agent, **Axelson Mfg. Co.,** Los Angeles, died June 7.

Carl N. Iffert, 60, Milwaukee district manager, **Bethlehem Steel Co.,** for many years, died June 10.

I. J. Koehnline, 60, sales manager, metal decorating division, **Wheeling Steel Corp.,** Wheeling, W. Va., died June 10.

N. E. Bartlett, 82, former vice president-sales, **Pennsylvania Salt Mfg. Co.,** Philadelphia, died June 7.

C. G. Fox Jr., 58, organizer and president, **Roper Range & Furnace Co.,** Rochester, N. Y., died June 6.

Arlington E. Stanton, vice president, **American Zinc, Lead & Smelting Co.,** St. Louis, died June 10.

Dr. H. S. Arthur, president, **Massillon Steel Casting Co.,** Massillon, O., died June 12.

C. C. Crubaugh, 64, sales engineer, **Morgan Engineering Co.,** Alliance, O., died June 15.

W. W. Ford, 65, Atlanta district sales manager, **Youngstown Sheet & Tube Co.,** died June 11.

J. W. Mullally, 55, manager of utility sales, **Anaconda Wire & Cable Co.,** New York, died June 10 in Washington while on a business trip.

John B. Briggs, 52, industrial specialist, Bars and Semifinished Section, Iron and Steel Division, National Production Authority, died of heart failure June 9 in his hotel room in Washington. He was on leave from Bethlehem Steel Co.

L. M. Hansen, 61, president, **Hansen Tool & Die Co.,** Milwaukee, died June 7.

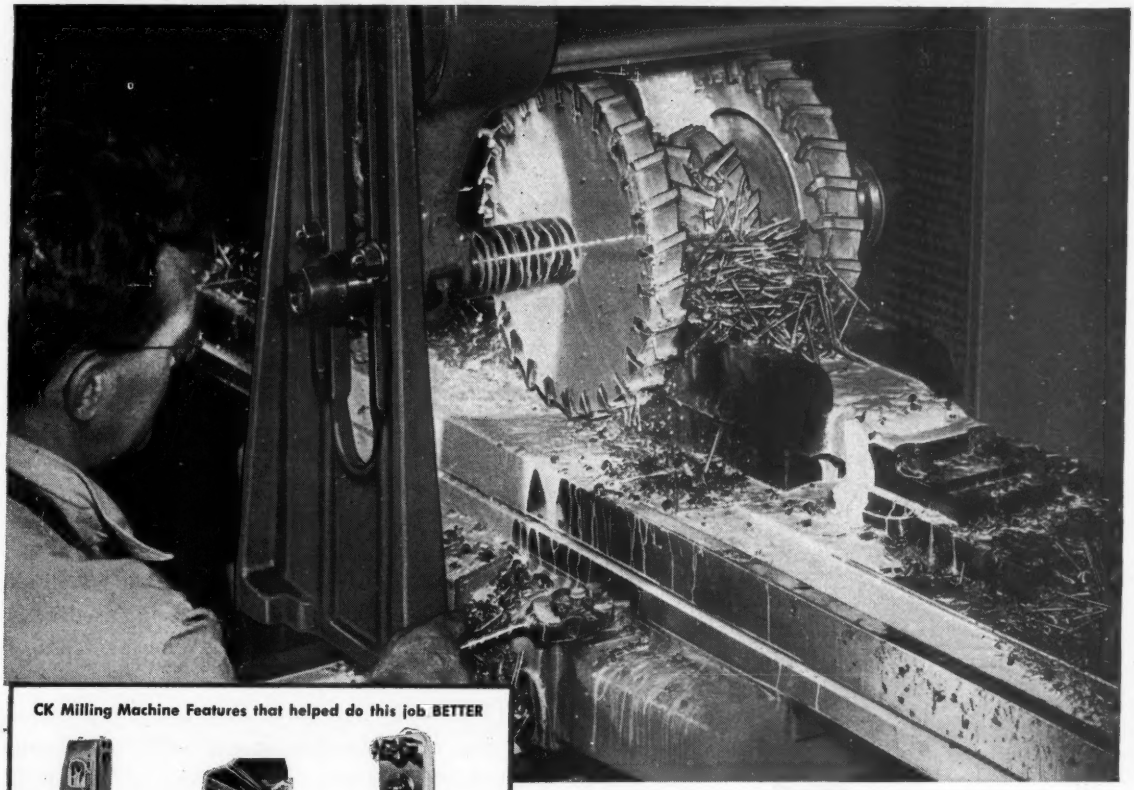
John S. Hegeman, until retirement in 1947 Detroit sales manager, **Bethlehem Steel Co.,** died June 10.

James Crothers, 56, production manager, **Lead Alloy Products Co.,** Detroit, died June 4.

William J. Wardell, 64, vice president and a director, **American Can Co.,** New York, died June 10.

FACTS TELL THE STORY...

NEW KEARNEY & TRECKER CK MILLING MACHINE PAYS USER BIG PRODUCTION DIVIDEND

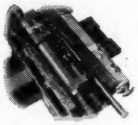


CK Milling Machine Features that helped do this job BETTER

New CK column easily absorbed vibration from heavy cutting load.

CK's large (2" dia.) screw and extra-long table feed nut permitted heavy cut.

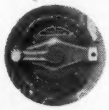
No. 60 heavy-duty drive flange on spindle drives heavy-duty arbor with multiple cutters.



CK's positive, metered, pressure and automatic lubrication assured wear-free operation.

Greater Horsepower of CK machine meant maximum results from modern cutting tools.

CK's 3-bearing spindle and flywheel assured fastest metal removal with desired finish.



24 different spindle speeds (13 to 1300 rpm) plus 32 different table feeds (⅜" to 90 ipm) meant operator selected exact combination to get fullest advantage from high horsepower and modern cutting tools.

The FACTS on this job are:

Machine: New 25hp No. 5, Model CK Plain.
Material: Cast Steel, 150 Brinell.
Feed: 4½ inches per minute.
Cutter Speed: 100 Surface feet per minute.
Rate of metal removal: 17.5 cu. in. per min.
Production rate: 4 parts per hour.
NOTE: Each part requires but a *single pass* of the cutter on the new Kearney & Trecker CK machine.

Old production rate 1½ parts per hour with two passes required per piece.

Investigate Kearney & Trecker's new CK line of milling machines. You'll find every feature is test and job-proven to give you cost-cutting results . . . greater machine capacity . . . greater productivity . . . better finished products. Contact your nearest Kearney & Trecker representative or write: Kearney & Trecker Corp., 6784 West National Avenue, Milwaukee 14, Wisconsin.

KEARNEY & TRECKER MILWAUKEE MACHINE TOOLS

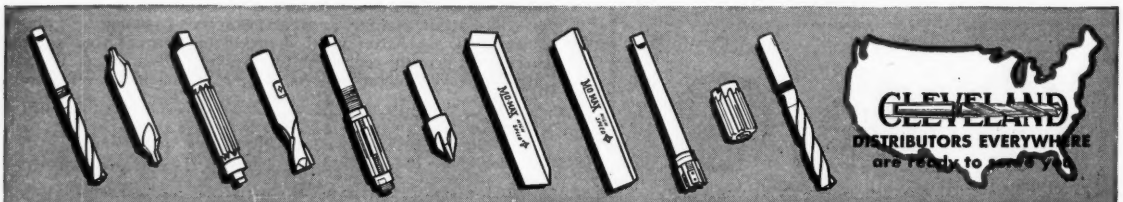
test proves that *Better Wearing Qualities* give you 42%

MORE HOLES PER GRIND

It was a smooth-running job—drilling 1 9/32" holes in a cast iron cover, ½" thick—but the superintendent wasn't satisfied with the wearing qualities of the high speed drills that were being used. They averaged 2705 holes per grind. ◈ When a *Cleveland* Service Representative was called in, he recommended a stock CLE-FORGE High Speed Drill that is engineered to reduce the wear caused by abrasive action. With no change in feed or speed, this drill averaged *3862* holes per grind! ◈ On *all* drilling operations, a *Cleveland* Service Representative can help you *speed the job* and *cut costs.* Contact our nearest Stockroom, or...

TELEPHONE YOUR INDUSTRIAL SUPPLY DISTRIBUTOR

THE CLEVELAND TWIST DRILL CO.
1242 East 49th Street • Cleveland 14, Ohio
***Stockrooms:* New York 7 • Detroit 2 • Chicago 6 • Dallas 2 • San Francisco 5 • Los Angeles 58**
E. P. Barrus, Ltd., London W. 3, England



ASK YOUR INDUSTRIAL SUPPLY DISTRIBUTOR FOR THESE AND OTHER *Cleveland* TOOLS

Production AND Engineering
NEWS AT A GLANCE

NOISE HELPS INDUSTRY—Sound waves seem to be drawing closer to the industrial picture. According to Battelle Memorial Institute, there is still no magical line that determines industrial usefulness of sound. But the building blocks are here. It is now possible to investigate and properly evaluate the application of ultrasonic energy to industrial processes on a pilot plant scale. One of the newest applications of high-powered sound waves is as a tool for drilling and marking hard or brittle material like carbides. Ultrasonics also is being used successfully in cleaning watches and electric shaver heads.

IT DEPENDS ON THE JOB—Can proper cutting fluids step up machining? A survey of over a hundred cutting fluid manufacturers indicates that they can. But there are a few factors involved. One is the application of the fluid to the particular machining operation. Another is selectivity hinging on the job to be done, metal used for the work, the cutter and even the type of operation. Fluids do differ, mainly because they are made that way—to perform different operations. For example, all do a cooling job, but they differ in the amount of cooling done. p. 72

LIVE STEAM "NOT SO HOT"—Use of live steam to speed up the action of solutions for cleaning grease and dirt-encrusted components of equipment hinders rather than helps the process. A study made by Magnus Chemical Co. reveals that where there was too much dependence on live steam for heating, there was a corresponding dilution of the strength of the solution due to dilution with condensed water. In several tests where it was assumed the normal concentration of cleaner was being maintained per gallon of water, the concentration actually was at half strength. Concentration was maintained and cleaning time became normal when use of live steam was reduced.

STEEL IS WASTED?—Better take another look at those heavy machinery columns. You may be wasting steel. Designer Fritz Fischer and head of the company by that name, in a recent report to the Secretary of the Interior, says that large machines are 30 per cent heavier than required for top working capacity. He cited four reasons for "habitual waste of materials in the heavy machinery field:" First, plain old fashioned conservatism; second, lack of knowledge, particularly about stress analysis; third, reuse of outdated foundry patterns to save costs; finally, over-cautiousness, the why take chances attitude, 'let's compute it and add another 100 per cent'. The remedy: Use of shell or stressed-skin construction. This, he says, can only be done by engineering agencies digging deeper into the study of stress analysis.

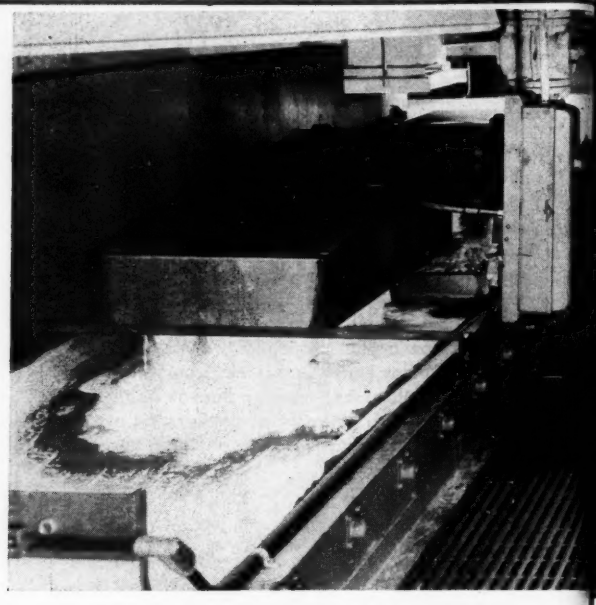
OVENS FIT THE WORK—If you can use radiant heat to process your work and are concerned with oven sizes, Edwin L. Wiegand Co. has come up with a system that you may be able to use. It includes infrared oven panels that can be erected in oven structures and connected to plant wiring, just as simple as that. Depending on size and shape required, complete ovens can be "built" in several hours and be ready to go into operation. p. 77

"ROLLBACK" WORKS—More than 60,000 weather-beaten combat and tactical vehicles of all types have thus far been rounded up by the Army in its "Operation Rollback". From these, collected from Guadalcanal to Okinawa and shipped to Japan, some 48,000 rebuilt units were produced from parts reconditioned. The operation was just getting launched when the fighting started in Korea. Now, the salvage program supplies 84 per cent of the general purpose vehicles, 38 per cent of the tanks, 80 per cent of all other combat vehicles, 68 per cent of the artillery, 55 per cent of the instruments and 70 per cent of the infantry weapons used by the UN army.

GIANT TONGS SPEED HANDLING—Looking something like the iceman's icehooks suddenly grown to mammoth size, the giant four-jawed tongs employed by General Steel Castings Corp. speeds handling and facilitates heat treating of 12-ton turrets for Army tanks. The huge devices are remotely controlled to eliminate worker hazards, and provide proper timing requirements for the heating, quenching and tempering operations. The company uses two pairs of tongs in its turret operation, one for lifting turrets after heating for hardening and the second for tempering. p. 80

CHEMICAL PREVENTS RUST—Here's a product that may help you lick your corrosion troubles. Its a new hydrocarbon chemical developed by Phillips Scientific Laboratories, North Arlington, N. J. The company says it prevents corrosion on ferrous, nonferrous and other types of surfaces. It can be used alone, applied by immersion, sprayed or painted on—during or after processing—or it can be added to paints, varnishes, lubricants, polishes or waxes.

Metalworking Outlook—p. 35 *Market Outlook—p. 145*



Method of applying Standard Oil Co. (Ind.) fluid to a herringbone gear cutting operation. Fluid drops on the work at the point of cutter contact

LET JOB CHARACTERISTICS CHOOSE IT

Proper Cutting Fluids Can Step Up Machining

Applying the right fluid in the right manner to your machining operation is one secret to efficient production. Factors include metal, cutter and operation

R. F. HUBER
Assistant Editor

OVER A HUNDRED cutting fluid makers can't be wrong. They agree that careful selection of the proper cutting oil or coolant may mean the difference between go and no-go on a production machining job.

They all say you get the best return on time and money by carefully analyzing the requirements of the job and using them as the basis for choosing the oil.

Variables in the Driver's Seat—Here are the factors that govern selection and use of cutting fluids:

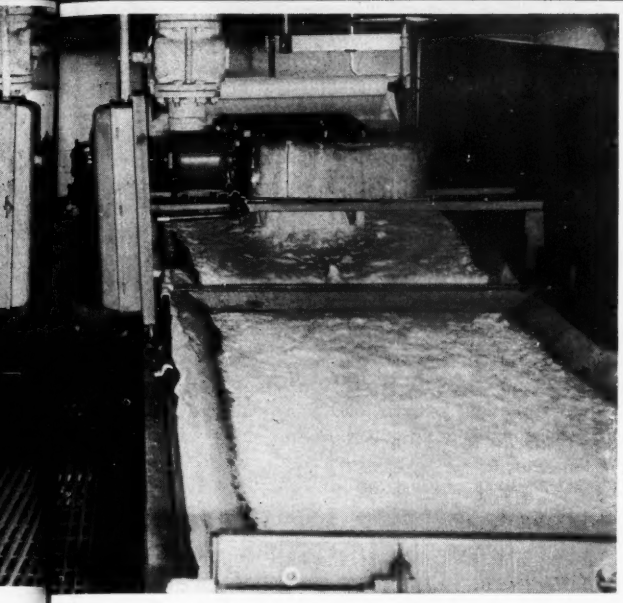
First is the material being machined. It may be free machining or it may be in the difficult-to-machine class. The way it reacts to the torture of a cutting tool must be considered in either instance.

Operation to be performed will have a large influence on the oil selected. Threading calls for one type and a finish grinding operation calls for another.

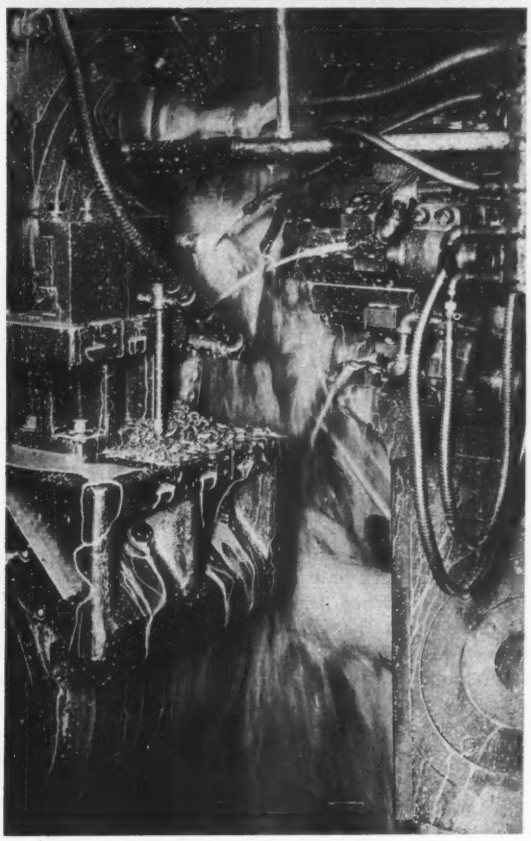
Cutting tool material can also influence the selection of cutting oil or coolant. Different tools lose their hardness at different temperatures. Thus some tool metals require more cooling capacity in an oil than others.

Cutting oils and coolants belong to the same group with a distinction made between those that physically assist cutting action and those whose primary function is to route heat away from the cutting area. Here is a general definition of both: Those liquids applied to a cutting area to aid the cutting operation.

Why Use Them?—In a machining operation several considerations are important. One of these is consistent holding of size and finish of the machined part. An-



Industrial Filtration Co., Lebanon, Pa., shows installation for central supply, filtration of cutting fluid



Application of fluid to a multiple spindle screw machine job from E. F. Houghton & Co., Philadelphia

other is time consumed in machining one part or a series or lot of similar parts. Proper use of cutting fluids is a direct aid to achieving good results in both.

Finish and size-holding will improve because of the effect of cutting oils on the cutter, workpiece and chip. Time in production will be reduced because higher speeds and feeds are possible than with dry machining. Another important time saving results from longer tool life, since tool changing time is actually waste time.

Reason for Difference—Oils differ mainly because they are made and blended to perform different functions. All of them perform the job of carrying chips from the cutting area. All do a cooling job but they differ in amount of cooling done.

Heat is generated during the machining operation and an excess of it contributes directly to tool breakdown. Water is probably the best cooling agent. Corrosive to the tool, workpiece and the machine, water must be modified by the addition of some oil or chemical as is done in soluble cutting fluids.

Friction between the chip and the tool poses another problem for cutting fluids. Frictional forces are exceptionally high in this area. Thus the actual lubricating qualities of the oil are important. Better lubrication reduces friction and the resulting chatter.

Needs Help—Pressure under the chip and on the tool reach such a magnitude that no oil alone can maintain a film to separate them. A chemical is added to some oils to maintain the pressure-resistivity quality.

As a result of the flow of metal across the tip of the tool, a deposit is left on the tool. This built-up edge can be both detrimental and beneficial to the cutting action. Thus proper control of build-up becomes important. An antiweld ingredient is added for this control. This welding factor is important in some grinding operations. Without antiweld protection the wheel loads and the grinding ability is lost.

Must Wet—Cutting fluids must adhere to the workpiece and have good wetting properties. Some coolants run off metals without spreading over the surface. They should cover the entire cutting area and should remain long enough to absorb heat and carry it away. Most of the chemical cutting fluids have this wetting ability as their chief aim. They are water base coolants designed to control cutter temperature.

These are the problems and jobs which a cutting fluid must cope with. Some aim at only one objective. Others contain several additives with an aim for general machining.

Each ingredient contributes a specific quality that makes for better machining. With lard oil or mineral oil as the base, chemicals are added to give the desirable characteristics.

No Fire—Mineral oil used in cut-

ting fluids must be of low viscosity so it can reach the tip of the tool and then flow away with the heat. Also it must have a low flash point so it doesn't ignite at the high cutting temperatures. It is used, with additives, for machining the medium and low carbon content steels.

Lard oil is used, with additives, for the severe operations on hard steels. It has excellent wetting properties and makes a stronger lubricating film than straight mineral oils.

Most common of the additives are sulphur and chlorine. Each is important in its own right. Both give cutting fluids desirable characteristics.

Works Two Ways—Sulphur as an additive performs two very important functions. First is the separating of the chip from cutter tip surface. When the chip rubs excessively on the tip, chatter is generated and a poor workpiece finish results. More heat accompanies the action and the whole machining operation is less effective and less profitable.

No oil can withstand the tremendous pressures experienced at the cutter tip. Sulphur works at the high temperatures to attack the underside of the chip, forming microscopic deposits of metallic sulphides. This sulphide film can stand temperatures which may exceed 1000° F and it can resist heavy pressures that would destroy less durable films.

Control the Cushion—The built-up edge left on the cutter tip protects the cutting edge and permits more cuts per grind—a direct saving. Amount of build-up must be controlled however, since excessive deposits will slough off periodically between the cutter and the work causing scored and torn finish.

Active sulphur in cutting fluids gives them antiweld properties which keep the build-up mobile and keep it from sticking to the cutting edge. D. A. Stewart Oil Co., Chicago, emphasizes amount of sulphur is important since the balance of build-up must be maintained. Cleaner cutting metals will require less antiweld ingredient than the draggy ones.

Won't Corrode—Inactive sulphur has high pressure-resistivity. At high temperatures active sulphur will corrode nonferrous metals and the inactive will not. This is particularly important when it is necessary to protect the bearings of a machine tool as well as the work. Inactive sulphur is generally preferred for many cutting operations for this reason.

The Texas Co., New York, points out the use of a dual-purpose cutting oil to combat this bearing-corrosion problem. In multiple spindle automatic screw machines one oil is used for machine lubrication and another for cutting fluid.

Any leakage of the lubricating oil into the cutting oil will reduce the compounding in the cutting oil. This decreases machine efficiency and lowers tool life.

Solution is the use of an oil prepared with noncorrosive additives which will benefit the cutting

Cutting fluid chart by C. M. Larson, chief consulting engineer, Sinclair Refining Co., New York, for the American Society of Lubrication Engineers

CUTTING FLUID RECOMMENDATIONS

ORDER OF SEVERITY	OPERATIONS	TOOL	FOR EASIER CUTTING IRON AND STEEL	TOOL	FOR HARDER CUTTING IRON AND STEEL
			TYPE OF COMPOUNDING		TYPE OF COMPOUNDING
1, 2	Broaching and Pipe Threading	HS	Lard; Active Sulphur (H, M)	HS	Lard; Active Sulphur; Chlorine (H, M)
		HS	Lard; Inactive Sulphur (H)	HS	Lard; Active Sulphur (H)
		HS	Soluble Oil and Water	CC	Lard; Inactive Sulphur (H)
		CC	Soluble Oil and Water	CC	Soluble Oil and Water
3	Tapping and Threading (*Plain*)	HS	Lard; Active Sulphur (H, M, L)	HS	Lard; Active Sulphur; Chlorine (H, M)
		HS	Lard; Inactive Sulphur (M)	HS	Lard; Active Sulphur (H, M)
4	Gear Cutting, Gear Shaving and Reaming (*Plain*)	HS	Lard; Active Sulphur (H, M, L)	HS	Lard; Active Sulphur; Chlorine (H, M)
		HS	Lard; Inactive Sulphur	HS	Lard; Active Sulphur (M, L)
		CC	Lard; Inactive Sulphur (M)	CC	Lard; Inactive Sulphur (H)
5	Drilling (Deep), Gun Drilling	HS	Lard; Active Sulphur (M, L)	HS	Lard; Active Sulphur; Chlorine (H, M)
		HS	Lard; Inactive Sulphur (M)	HS	Lard; Active Sulphur (H, M, L)
		HS	Soluble Oil and Water	CC	Lard; Inactive Sulphur (H)
		CC	Soluble Oil and Water	CC	Soluble Oil and Water
6 7	Milling and Boring, Multiple Spindle Automatic Screw Machines and Turret Lathes: Drilling, Forming, Turning Reaming, Cutting Off, Tapping and Threading	HS	Lard; Inactive Sulphur (H, M, L)	HS	Lard; Active Sulphur (L)
		HS	Soluble Oil and Water	HS	Lard; Inactive Sulphur (M)
		CA	Soluble Oil and Water	CA	Lard; Inactive Sulphur (L)
		CC	Soluble Oil and Water	CC	Lard; Inactive Sulphur (L)
				CC	Soluble Oil and Water
8 9	High Speed, Light Feed Automatic Screw Machines: Drilling, Forming, Tapping, Threading, Turning, Reaming, Box Milling and Cutting Off, Drilling, Planing, Shaping and Turning	HS	Lard; Inactive Sulphur (M, L)	HS	Lard; Active Sulphur (L)
		CA	Soluble Oil and Water	HS	Lard; Inactive Sulphur (M)
		CC	Soluble Oil and Water	HS	Soluble Oil and Water
				CA	Lard; Inactive Sulphur (L)
				CA	Soluble Oil and Water
				CC	Soluble Oil and Water
10	Sawing		Soluble Oil and Water	—	Lard; Inactive Sulphur (L)
			Lard; Inactive Sulphur (L)	—	Soluble Oil and Water
10	Grinding		Soluble Oil and Water	—	Soluble Oil and Water
10	Thread Grinding, Etc.		Lard; Active Sulphur and Chlorine with Light Mineral	—	Lard; Active Sulphur and Chlorine with Light Mineral

FOR OTHER EASIER CUTTING METALS

MAGNESIUM ALLOYS		
(1-10)	HS	Light Mineral Oil
	CC	Light Mineral Oil
ALUMINUM		
(1-10)	HS	Concentrate and Kerosine
(6-10)	HS	Soluble Oil, Water and Kerosin
(6-10)	CC	Soluble Oil and Water
BRASS AND BEARING BRONZE		
(1-10)	HS	Lard and Mineral (H, M, L)
(6-10)	CC	Dry
ZINC		
(1-10)	HS	Soluble Oil and Water
(6-10)	CC	Soluble Oil and Water

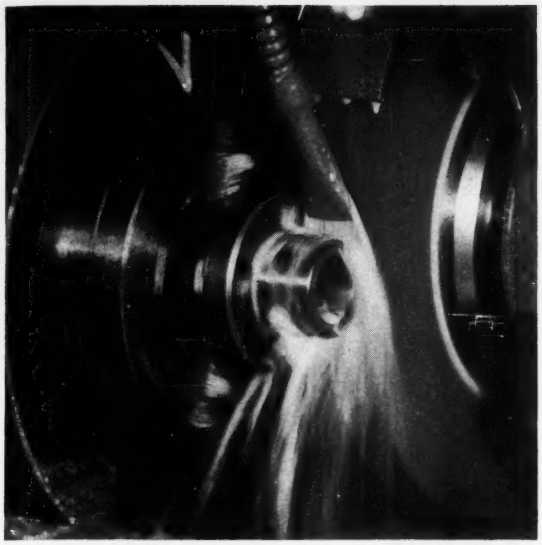
Numbers in Parentheses refer to Order of Severity

FOR OTHER HARDER CUTTING METALS

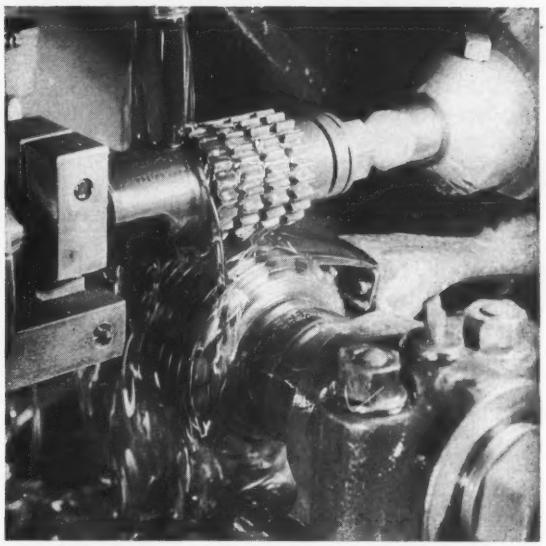
COPPER AND GUN METAL		
(1-10)	HS	Lard and Mineral (H, M, L)
(6-10)	HS	Soluble Oil and Water
(1-10)	CC	Soluble Oil and Water
EVERDUR (Silicon Bronze)		
(1- 5)	HS	Lard and Mineral (H, M, L)
(6-10)	HS	Soluble Oil and Water
(1-10)	CC	Soluble Oil and Water
MANGANESE BRONZE		
(1 -5)	HS	Lard and Mineral (H)
(6-10)	HS	Lard and Mineral (H, M, L)
(1-10)	CC	Soluble Oil and Water
NICKEL, MONEL METAL AND INCONEL		
(1-10)	HS	Lard; Active Sulphur (L)
(1-10)	CC	Soluble Oil and Water

TOOL MATERIAL
HS—High Speed Steel CA—Cobalt Alloys (Stellite) CC—Cemented Carbide

STRENGTH OF COMPOUNDING
(H)—High (M)—Medium (L)—Low



Cincinnati Milling Machine Co., Cincinnati, directs adequate flow of fluid to the point of wheel contact



Warner & Swasey Co., Cleveland, illustrates two streams of oil being applied to a gear hobbing operation

action and still protect the machine parts.

It Wets Better—Chlorine is a useful additive in machining hard steels at low feeds and speeds. While it is short on the antiweld side it has good wetting and lubricating ability.

Graphite, molybdenum disulphide, mica and other products are sometimes added to a mineral or lard base oil to reduce friction. With these additives it is usually necessary to agitate periodically to prevent settling.

Wrong Name—Soluble oil is a misnomer since no oil is soluble in water. The oil is actually suspended in an emulsion. An average mixture is one part oil to 15 or 20 parts of water. Primary function of the liquid is to cool the chip, workpiece and tool. As pointed out by Cities Service Oil Co., New York, oil in the emulsion has moderate rust-preventative qualities. Antiweld and pressure-resistant oils are sometimes added to soluble oils to include these features.

Several precautions should be taken in using soluble oil. Tidewater Associated Oil Co., New York, emphasizes that it should not be used with magnesium because of the fire hazard. Also water never should be added to the oil. Oil must be poured into the water to prevent an excess of oil at any one time. If the water content of the mixture is too low an inverted emulsion results. Inverted emulsion makes a poor coolant.

When inversion occurs, best advice is to discard it, clean the system and start from scratch. Rancid odors in oils are due either to the additives or, more often, to a high bacteria count.

To the Point—Even more important than using the right cutting fluid is the proper application of the fluid to the cutting area. Wrong fluid will still give some benefit. When the best cutting oil does not reach the critical area there is no gain.

Fluid must get in under the chip on the surface of the cutter to do any lubricating. In a turning operation a large overhead stream is played on the top of the chip, flooding it and carrying the heat off. The overthrow goes under the chip for lubrication. When it is possible another stream should be played in from the side or from below the cutter to better flood the surface of the cutting tip.

Lubrication by Force—A recent refinement of the idea of getting oil to the tool tip is Gulf Oil Co.'s Hi-Jet system. It forces oil from below the cutter, at about 500 psi, up to the cutting edge. Streams are about 0.015-inch in diameter. The oil breaks up into mist and the heat of the cutter tip boils it. It then is drawn between the tool and the workpiece through minute intermittent openings. Test results show that the tool tip is being lubricated. Cutting speeds and feeds are improved with two to three times the cutter life.

Socony-Vacuum Oil Co., New York, says that in milling operations, best results are secured if a large stream of cutting fluid is directed at the point of cutting; one on each side of the cutter. A small stream, dripping on the upper part of the cutter does very little effective lubricating or cooling.

Grinding operations, particularly thread-grinding, call for two small pressure jets to be directed at the point where the wheel touches the work. A low pressure system is not effective since the centrifugal force and windage of the wheel prevent the fluid from reaching the critical area. DoAll Co., Des Plaines, Ill., product is applied at the center of the wheel and is carried by centrifugal force, through the wheel to the outside diameter.

Deep Drilling Takes Two — A single stream should be directed into the hole on drilling operations. If the hole is large and long or deep, a second stream should be

played on the outer surface of the drilled piece for more thorough cooling.

Plant selection of a cutting fluid is often a problem since a great variety of work goes through the machining departments. When possible it is economical to standardize on one fluid. This is done with small sacrifices on some machining jobs, but the savings through standardization compensate for the small losses.

Look for Odd Job—Even under these conditions of standardization it is always advisable to watch for jobs which could be improved substantially through the use of another cutting oil or coolant. If an active sulphur oil is used generally, change to a passive sulphur oil for nonferrous metals.

Central supply of the cutting fluid saves both money and floor space. One reservoir and one filtering unit can supply the fluid for a group of machines. Requirement is that the work going across the group is constant and similar.

That there is a difference in cutting oil requirements from one job to another is substantiated in reports from numerous cutting fluid manufacturers.

Trial and Error—Machining C-1118 steel on an 8-spindle automatic one company tried seven different heavy duty soluble cutting fluids including one made by Pate Oil Co., Milwaukee. None of them gave the production wanted. Straight cutting oil was tested but gave poorer results than the others. Pate's highly compounded straight cutting oil was put in by mistake. Almost immediately the manufacturer had an increase in tool life.

The cutting oil was not compatible with the water emulsion, and in time they had gumming of the slides and other parts of the machine. A soluble oil containing the ingredients of the combination was formulated and continuing high production resulted.

Tough Job—Fiske Brothers Refining Co., Newark, N. J., ran into a job calling for 29 cutters to be used in rifling gun barrels of SAE 4140 steel. Sulphur lard cutting oil was the standard in the shop and it was tried first but results were poor.

Oils with a heavier sulphur base were tried as were heavier base straight cutting oils but results were still not good enough. The final answer was a sulfo-halogenated mineral lard oil.

Report from G. Whitfield Richards Co., Philadelphia, tells about a job machining steel fuse bodies. Sulphurized oils were used with only fair results. Soluble oil was tried and lack of pressure resistivity and oiliness gave unsatisfactory results. Answer here was an oil with good wetting and pressure characteristics.

Plus a Bonus—Stevens Grease & Oil Co., Cleveland, had one job where the finish of the part became a problem. Choosing a transparent soluble coolant the finish requirements were met. A big bonus resulted when a second operation was eliminated.

These are just a few of the many examples. Standard Oil of Ohio, Cleveland, says choosing the proper fluid becomes a matter of studying individual customer needs. The variables involve many factors in each metalworking operation. The company states that the same type of operation, because of the type of metal being machined, may require the use of an entirely different cutting fluid and if such an operation is to be successful it will necessitate changes in the control speeds and feeds.

Final authority is the cutting oil company representative. He makes his living and reputation on the success or failure of your machining efforts.

Sun Oil Co., Philadelphia, shows application of soluble oil to a heavy drilling operation. Shape and color of chip is a guide to good machining

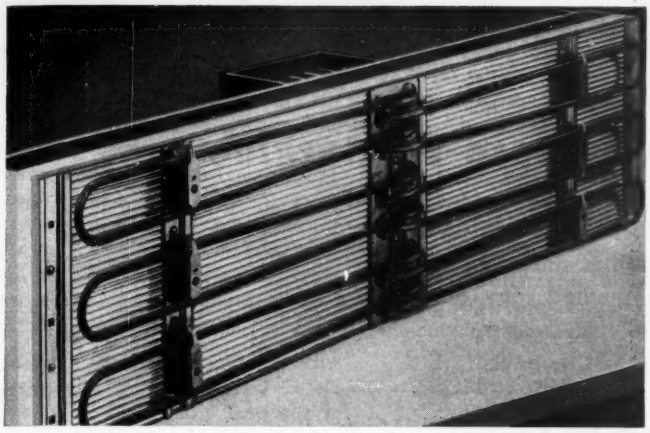
Process Cleans Weld Seams

Improved method for removing heat discoloration from welded seams has been developed by Research Division, Armco Steel Corp., Middletown, O. Operation is especially effective on hard-to-get-at inside corners of sheet metal work.

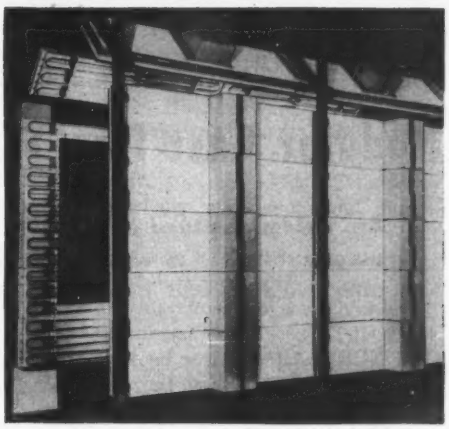
Armco says its electrolytic process is simple and inexpensive to set up and operate. An alternating current power source is used. Equipment consists of a short length of copper rod, some rubber tubing, electrical wiring, clamps, a step-down transformer and a solution of 50 per cent phosphoric acid.

Discolored weld seams can be treated at rates of 2 to 4 feet per minute with the proper setup. Process leaves the weld area clean and bright, free of discoloration.

Patent has been applied for, and the company will permit use of the process free of charge.



View of panel shows electric elements, reflective sheeting, ventilation slots. Weight is 14 pounds per sq ft



Total erection time for this oven assembly was 16 man-hours. Panels are bolted to steel framing from stock

MEETS IMMEDIATE HEATING NEEDS

Radiant Oven Adapts to Job

INFRARED oven panels about as adaptable as a chameleon are produced by Edwin L. Wiegand Co., Pittsburgh. The panels arrive on the job complete, ready to be erected in oven structures and connected to plant wiring.

Simplicity of the panels meets the need for ovens that can be built quickly, easily and economically. Depending on size and shape, complete ovens can be erected in several hours and be ready to go into operation.

Energy radiated by this far-infrared generator is absorbed with practically equal speed by all colors from black to white, with negligible reflection. Even clear glass and plastics absorb this radiation. Far-infrared, the long wave length variety, offers absorption efficiency advantage which results in very rapid heating, bringing work to temperature quickly thereby reducing both oven and conveyor lengths.

Dialed Heat—Ideal for work which requires crowding heat in a limited space, as with conveyorized degreasing, the intense radiation can also be dialed—from 4 to 100 per cent of capacity. Result is the accurate selecting and maintaining of work temperatures up to 700°F. Once the heat requirements are determined, the inexpensive controller dial setting can be logged and the heat output duplicated at any time.

Two sizes of Chromalox radiant panels are available: 1 x 4 feet, with a capacity of 10.8 kw—and the 2 x 4 foot panel with 21.6 kw capacity. Output of panels is in excess of 9200 Btu per square foot per hour. These two modular sizes can be assembled into ovens of almost any length, width or height. They can also be rearranged to fit new work size, or readily moved to various locations.

Advantages — Five-ply, built-in thermal insulation, with air space between layers permits a 500°F ambient inside of oven while outside surface is cool. Built-in bus bars allow connecting as many as seven adjacent panels in parallel with only one power supply connection. Bus has 100 amp capacity per line and can be used with single or three-phase power up to 575 volts.

Tubular elements give even heating pattern. Heated length of one unit stops at center of panel exactly where heated length of next one begins. Airways between insulation layers can be used to preheat air for solvent evaporating applications or other drying uses. Air may be forced downward through preheating airways to introduce warmed air at bottom of oven. This prevents cold air from hitting the work in lower portions of the oven.

Technical Reports Listed

Technical developments produced in government or in government-supported laboratories are reviewed in the current issue of the "Biblography of Technical Reports," available from the Office of Technical Services, U. S. Department of Commerce, Washington.

Specific developments described include: High-voltage selenium rectifier manufacturing process; electrical processes for machining and grinding; techniques for protection and electrodeposition of metals; silver plating process for magnesium alloys.

Motors on Film

Fractional horsepower motors, their selection and use, are the subjects of a 35-mm, black-and-white, sound slide film and allied literature offered by General Electric Co., Schenectady, N. Y.

Film has a running time of 21 minutes. It describes the broad uses of fractional horsepower motors in its various applications. It explains the five kinds of motors in the family, to educate those who work with them.

JOINTS STRONG BUT LACK DUCTILITY

Nodular Cast Iron Welds Hard to Machine

Arc welded joints of one type of ductile cast iron for uses usually restricted to welded steel castings shows annealing after welding and better welding method may do trick

By E. F. DAVIS
and
E. L. LAYLAND
Westinghouse Electric Corp.
East Pittsburgh, Pa.

CAN NODULAR cast iron be electrically welded so it can be used in applications ordinarily restricted to welded steel castings?

The answer is more or less in the "maybe" stage. A study shows that electric arc welds of one type of nodular cast iron approach the strength of the parent metal, but lack ductility, and are extremely hard to machine.

The same investigation also indicates the effects of preheating and post-annealing on the mechanical properties and soundness of electric arc welds joining nodular iron to itself, and to mild steel with two types of electrodes.

What Was Involved—For comparison purposes, tensile data were obtained from welded gray cast iron specimens of ASTM class No. 20.

The nodular cast iron weld test specimens were sawed from blocks 4½ x 4½ x 9½-inches. These had been annealed by heating for two hours at 1700° F, slowly cooling to 1275° F and holding for five hours, cooling to 1175° F and holding for five hours, followed by furnace cooling to approximately 800° F.

Table I shows the chemical composition and tensile properties of the test blocks.

The steel used in this study was ⅝-inch thick mild steel plate. Welding electrodes were a coated nickel-iron rod containing approximately 55 per cent nickel (generally recommended for electric arc welding of nodular iron) and a coated nickel rod rather widely used in the electric arc welding of gray cast iron.

Beads Laid—For butt welds made with the nickel electrode, the first bead was deposited with ⅛-inch rod, and subsequent ones with 5/32-inch using straight polarity. With the nickel-iron electrode, the first and second beads were made with ⅛-inch rod followed by 5/32-inch rod that uses reversed polarity.

To complete the welds, five layers were required in addition to a one-bead layer deposited on the back side after removing most of the foot bead. The first and second layers each consisted of one bead, the third layer of one woven bead or two stringer beads, the fourth layer of two beads, and the fifth layer of three beads.

The fillet welds of the double-strap type specimens were built up to ⅜-inch in three passes. Pad welds made under various conditions listed in Table III were deposited on faces of ⅝ x 4 x 4½-inch blocks, and on 2 x 2 x 4-inch blocks.

Currents Applied—Welding currents ranged between 130 and 140 amp for the ⅛-inch rod and between 160 and 180 for the 5/32-inch rod. Each bead was cleaned of slag and peened before depositing the next bead.

Specimens 1-5 and 7 were welded as a group by depositing one layer on each specimen before adding another layer to the first. The other specimens were welded individually with welding of one being completed before starting of welding of the next.

In the latter case, the temperature of the base metal near the weld exceeded 1000°F, whereas in the former the maximum interpass temperature approximated 200°F, except for the preheated specimens which were heated as necessary before each layer of weld was deposited.

What Happened—Tables II and III show results of tensile, hardness, and x-ray tests on specimens that are welded under the various conditions.

Sound welds were obtained with the nickel-iron rod, but use of the nickel rod resulted in weld cracking. This type of nodular iron is crack-sensitive, but to a lesser exten than gray cast iron.

Relatively slow dissipation of the welding heat into the parent metal, a characteristic of gray cast iron, was noted in welding the nodular iron.

The strength of butt welds made with nickel-iron electrodes joining nodular iron ranged between 50,000 and 60,000 psi whereas gray cast iron showed only approximately 10,000 psi tensile strength.

By preheating at 550°F a minor decrease in strength resulted, whereas post-annealing at 1700°F reduced the strength to 30,000-42,000 psi. The strength of fillet welds made with nickel-iron electrodes joining nodular iron was approximately 10,000 pounds per

TABLE I—CHEMICAL COMPOSITION OF NODULAR IRON TEST BLOCKS—PER CENT

Carbon	Silicon	Phosphorus	Sulphur	Magnesium	Nickel	Manganese
3.47	2.32	0.114	0.011	0.068	1.85	0.49

TENSILE PROPERTIES OF NODULAR IRON TEST BLOCKS

Yield Strength psi	Ultimate Strength psi	Elongation in 2 inches, %	Brinell Hardness
57,600	68,650	5.0	183

linear inch of the ⅜-inch fillet weld.

Cracks Show—The ductility of the weld metal deposited from both types of electrodes was negligible. Fracture occurred in the welds joining nodular iron to nodular iron, whereas the gray iron weldments broke in the parent metal and most of the steel-nodular iron weldments broke in the steel. By preheating and post-annealing, below and above the critical temperature range respectively, the ductility was not improved.

The Analysis—Electric arc welding resulted in an extremely hard narrow zone difficult to machine which was not appreciably affected by preheating. Full annealing after welding, however, did lower the hardness of the weld zone to that of the base metal. Metallographic examination showed that the hard zone contained large amounts of martensite, and that the weld metal contained numerous small graphite particles, the majority in the form of small flakes.

These constituents are responsible for the hardness and lack of ductility of the welds. To achieve an easily machinable and ductile weld zone with this type of nodular cast iron would require annealing after welding together with further development of suitable welding techniques.

TABLE II—TENSILE PROPERTIES OF BUTT WELDS

Mark	Mtls. Joined	Type Rod	Preheat	Post Anneal	Yield Strength psi	Ultimate Strength psi	Elongation %	Fracture Location	X-Ray Examination of Machined Tensile Specimens
1–1	N.I. to N.I.[1]	Nickel	None	None	.....	21,200	2	Weld	Large crack in weld metal parallel to electrode travel
1–2	N.I. to N.I.[1]	Nickel	None	None	.....	33,100	2	Weld	Porosity at edge of weld
2–1	N.I. to N.I.	Nickel	None	None	.....	10,500	1	Weld	Large crack in weld metal parallel to electrode travel
2–2	N.I. to N.I.	Nickel	None	None	.....	23,000	1	Weld	Two cracks in weld metal parallel to electrode travel
3–1	N.I. to N.I.	Nickel-iron	None	None	.....	50,800	1	Weld & Weld Junction	Slight amount of porosity in weld
3–2	N.I. to N.I.	Nickel-iron	None	None	.....	58,200	1	Weld	
4–1	N.I. to N.I.	Nickel-iron	None	None	.....	60,200	2	Weld Junction	Slight amount of porosity in weld
4–2	N.I. to N.I.	Nickel-iron	None	None	.....	60,300	2	Weld Junction	
5–1	N.I. to N.I.	Nickel-iron	550 F	None	.....	49,800	1	Weld Junction	No defects
5–2	N.I. to N.I.	Nickel-iron	550 F	None	.....	51,700	2	Weld & Weld Junction	
6–1	N.I. to N.I.	Nickel-iron	550 F	None	.....	47,800	3	Weld & Weld Junction	Slight amount of porosity in weld
6–2	N.I. to N.I.	Nickel-iron	550 F	None	.....	50,100	3	Weld & Weld Junction	
7–1	N.I. to Steel	Nickel-iron	None	None	30,800	48,700	21	Steel	Slight amount of porosity in weld
7–2	N.I. to Steel	Nickel-iron	None	None	30,800	48,600	20	Steel	
8–1	N.I. to Steel	Nickel-iron	None	None	35,900	50,700	20	Steel	Slight amount of porosity in weld
8–2	N.I. to Steel	Nickel-iron	None	None	38,200	49,500	10	Weld	
9–1	N.I. to Steel	Nickel-iron	550 F	None	31,500	45,600	6	Weld Junction	Slight amount of porosity in weld
9–2	N.I. to Steel	Nickel-iron	550 F	None	36,400	47,400	14	Weld & Weld Junction	
10–1	N.I. to Steel	Nickel-iron	550 F	None	31,900	47,000	7	Weld	Slight amount of porosity in weld
10–2	N.I. to Steel	Nickel-iron	550 F	None	31,800	48,500	12	Steel	
11–1	N.I. to N.I.	Nickel-iron	None	1700 F	.....	32,900	1	Weld	.....
11–2	N.I. to N.I.	Nickel-iron	None	1700 F	.....	31,700	1	Weld	.....
12–1	N.I. to N.I.	Nickel-iron	None	1700 F	.....	30,800	1	Weld	.....
12–2	N.I. to N.I.	Nickel-iron	None	1700 F	.....	42,100	1	Weld	.....
13–1	G.I.[2] to G.I.	Nickel	None	None	.....	11,100	1	Gray Iron	.....
13–2	G.I.[2] to G.I.	Nickel	None	None	.....	10,600	1	Gray Iron	.....
14–1	G.I. to G.I.	Nickel	None	None	.....	8,300	1	Gray Iron	.....
14–2	G.I. to G.I.	Nickel	None	None	.....	10,000	1	Gray Iron	.....

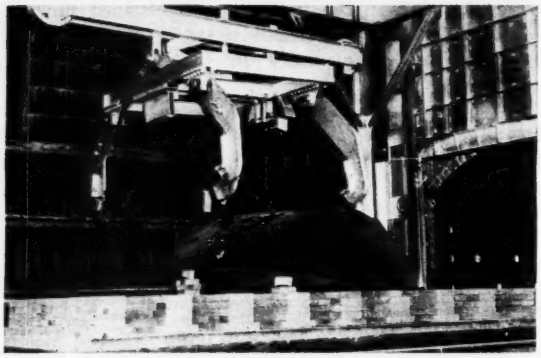
FILLET WELDS

Mark	Mtls. Joined	Type Rod	Preheat	Ultimate Strength Pounds/linear inch of Weld	Elongation	Fracture Location	X-Ray Examination of Tensile Specimens
A	N.I. to N.I.	Nickel	None	5,160	0	Welds	No defects
B	N.I. to N.I.	Nickel	None	5,840	0	Welds	No defects
C	N.I. to N.I.	Nickel-iron	None	9,640	0	Welds	Considerable porosity in one weld

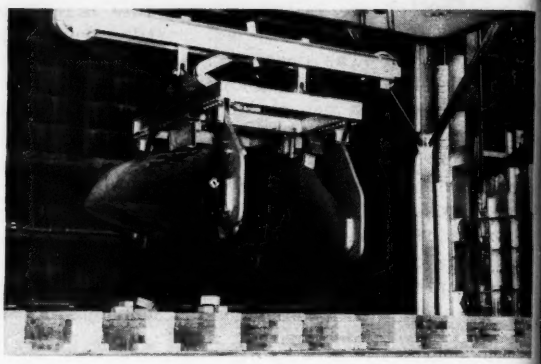
[1] N.I. represents nodular iron.
[2] G.I. represents gray iron, ASTM Class No. 20, cast in 4¼" x 4¼" x 9" blocks.

TABLE III—VICKERS HARDNESS OF WELDED NODULAR IRON

Mark	Weld Rod	Preheat	Post Anneal	Type Weld	Maximum Hardness Detected in Weld Zone	Hardness at 1/32" from Edge of Weld: On weld metal side	Hardness at 1/32" from Edge of Weld: On parent metal side	Hardness of Weld Metal	Hardness of Parent Metal
15	Nickel 1/8"	None	None	Pad—1 layer	627	...	270	193	220
16	Nickel 5/32"	None	None	Pad—1 layer	421	...	282	194	208
17	Nickel 1/8"	None	None	Pad—2 layers	464	...	397	185	248
1	Nickel 5/32"	None	None	Butt	413	...	292	186	218
2	Nickel 5/32"	None	None	Butt	514	...	514	183	218
18	Nickel-iron 1/8"	None	None	Pad—1 layer	525	...	300	204	200
19	Nickel-iron 1/8"	None	None	Pad—2 layers	503	...	425	227	...
3	Nickel-iron 5/32"	None	None	Butt	585	183	270	180	218
20	Nickel-iron 5/32"	300 F	None	Pad—1 layer	481	292	272	279	226
21	Nickel-iron 5/32"	500 F	None	Pad—1 layer	601	298	312	309	208
22	Nickel 1/8"	500 F	None	Pad—2 layers	437	...	280	180	196
23	Nickel-iron 5/32"	600 F	None	Pad—1 layer	579	242	281	173	234
24	Nickel-iron 5/32"	700 F	None	Pad—1 layer	528	187	312	191	246
25	Nickel-iron 5/32"	800 F	None	Pad—1 layer	444	331	248	337	177
26	Nickel-iron 5/32"	900 F	None	Pad—1 layer	564	195	287	206	226
27	Nickel-iron 5/32"	None	1275 F	Butt	376	170	230	176	210
28	Nickel-iron 5/32"	550 F	1275 F	Butt	548	165	240	162	233
11	Nickel-iron 5/32"	None	1700 F	Butt	224	157	224	163	207



Tongs approach red hot turret before furnace door closes. Remote control eliminates need for close approach



Overhead crane moves red hot turret to quench tank. Refractory brick prevents heat damage to equipment

HEAT TREATING EASIER

Giant Tongs Expedite Turret Handling

Remote control from panel eliminates worker hazard and increases production of turrets for Army tanks. Close control of hardening, tempering gives maximum strength

REMOTE control handling of turrets for new Army tanks at General Steel Castings Corp., Eddystone, Pa., utilizes special tongs to save time and eliminate a potential hazard to workers. The tongs made by Heppenstall Co., Pittsburgh, are used in these operations. Heating for hardening, quenching, tempering and requenching.

Company is a major supplier of tank turrets for the Philadelphia Ordnance District. The cast steel turrets weigh 7 to 12 tons each. Early World War II tanks had riveted turrets but danger to personnel from flying rivets when the turret was struck by a projectile that did not pierce the armor forced a design change. Tanks now have cast steel turrets with either cast or welded steel hulls.

Divide the Job—Two pairs of tongs, one for lifting turrets after heating for hardening and the second for tempering reheat, are used in the new heat treat department. Gas-fired Selas furnaces are used to heat the turrets.

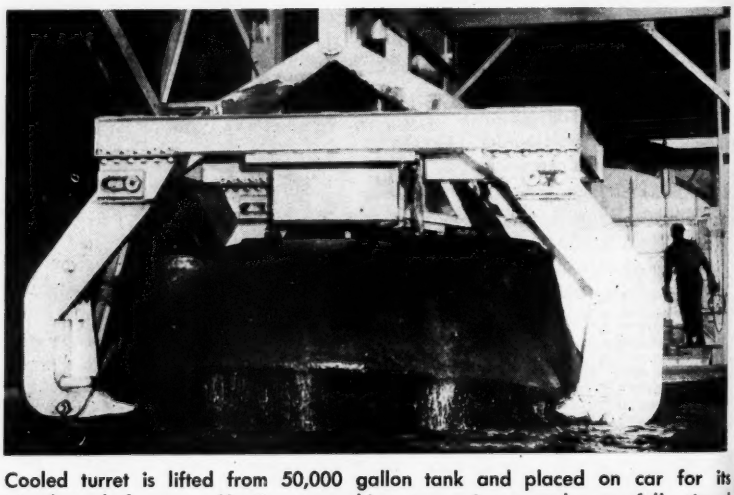
Turrets are preheated to avoid damage from a sudden temperature change, then placed on electrically controlled rail cars for their trips through the furnaces. Bed of each car is covered with refractory brick to prevent heat damage to car, tracks and control equipment.

Into Action—First pair of tongs goes into operation as soon as the car containing the heated turret emerges from the furnace. A lever on the control panel causes the four-jawed tongs to lower directly over the turret, where they automatically lock in position.

After lifting the turret the tongs are carried on an overhead crane a short distance away to a position above the quench tank. The tongs then lower the hot turret into the 50,000 gallon tank, through which the water is circulated at the rate of 3000 gpm.

After the turret is quenched, the tongs raise the turret from the water and deliver it to a cool car for its trip through the tempering furnace. With the turret safely in position, the jaws of the tongs automatically open and the tongs are raised out of the way.

When the turret emerges from the tempering furnace, a second pair of tongs is used to lift it from the car and to give it a second quenching. The turret is then ready for finishing operations.



Cooled turret is lifted from 50,000 gallon tank and placed on car for its trip through furnace. Heating, quenching, tempering must be carefully timed

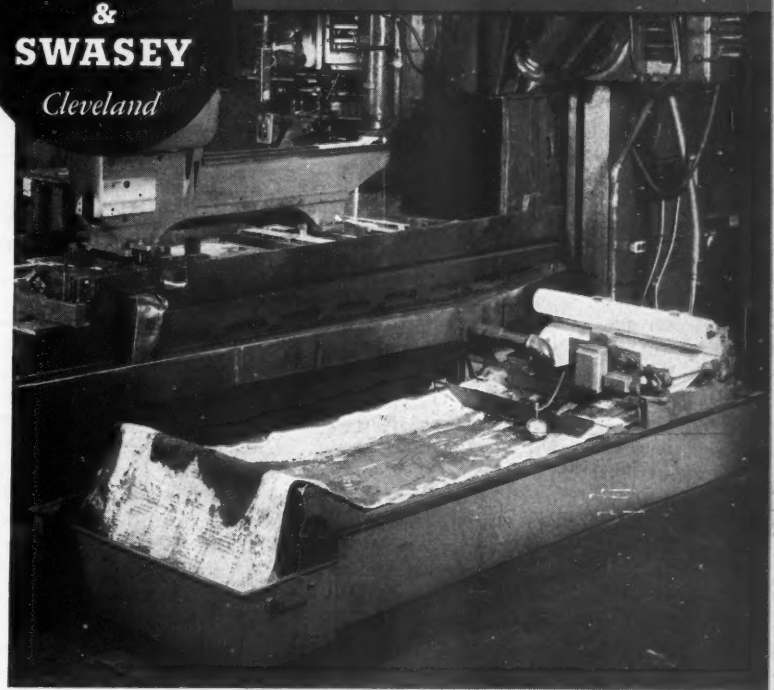
CASE HISTORY

Delpark

INDUSTRIAL FILTERS

★ SAVE TIME ★ SAVE MONEY ★ SAVE EQUIPMENT

FOR **WARNER & SWASEY** *Cleveland*



● THIS STORY, typical of numerous Delpark case histories, comes from the Warner & Swasey Company, the world's largest manufacturer of turret lathes.

Work scratches on machine ways, caused by grinding wheel particles returning to the work in unfiltered coolant, caused much extra work and reduced vital production. Additional equipment, to increase production, was being considered at a cost of $36,000.

Improvements made through the use of three Delpark Filters increased production to such an extent that plans to purchase additional equipment were cancelled, at a substantial saving in capital investment to the customer. By supplying the grinding wheel with clean, filtered coolant for free, fast-cutting action, production quality was not only increased but expensive down time previously required for sump cleaning was eliminated.

Each filter uses fifty yards of filter material per month at a cost of $6.75 per month for filter material.

This case history is being repeated in numerous industrial plants throughout the country where Delpark Industrial Filters are supplying fine industrial filtering.

Let a Delpark Industrial Filtering Specialist show you the facts on the finest in Industrial Filtration. Write for more complete information.

PATENTS PENDING

Delpark

INDUSTRIAL FILTRATION

Backed by 30 Years Experience in Industrial Filtration

INDUSTRIAL FILTRATION CO. BOX A-35 LEBANON, INDIANA

BLAST FURNACE PRACTICE

By CHARLES E. AGNEW
Consultant
Blast Furnace and Sintering Plant Operations
Cleveland

Beneficiation of Air—XI(d)

Herein is described how furnace operating conditions can be created to permit use of oxygen-enriched air thereby increasing iron production with reduced blast and fuel

THIS is the final article in the series on "Blast Furnace Practice" which has been appearing in STEEL intermittently since Dec. 10, 1951. Various installments have brought together valuable information on slags, gas flow through the stack, influence of bosh thermal conditions on the fuel consumption and iron production, carbon solution loss, the use of calcite and dolomite as fluxes, quantitative measurements of chemical and thermal reactions, preparation of raw materials in the furnace shaft, high-pressure operation, use of oxygen-enriched air, and sintering, nodulizing, briquetting and pelletizing of iron ores.

To assist blast furnace personnel in their study of slag chemistry, in dealing with new operating conditions under foreign ore practice, and in the use of practical methods to meet operating principles, reprints of the complete series comprising the 19 installments will be available in a few weeks for $1.00 per copy, postpaid.

UNDER furnace operations where the ratio of raw material preparation to smelting capacities permits the use of oxygen-enriched air, the blast weight is reduced and the stock travel rate and the raw material preparation rate remain constant, but the delivery of heat to the shaft operation by gas rising from the smelting zone will be reduced 8.50 per cent. However, at any given temperature the reduction of the gas weight passing through the stock column also will reduce its velocity. Reduced velocity of gas through the column and the faster stock travel provide a greater opportunity for the heat recovery from the gas and the salvage of heat which otherwise would be drained from the furnace by the greater weight of the gas.

If the blast weight is held constant and the stock travel rate is increased with oxygen-enriched air, partially comparable conditions are created for the increased heat recovery with the faster stock travel because the increase in the stock travel rate is greater than the increase in the gas weight produced—but there is not the advantage of a reduction in the gas velocity other than the natural advantage caused by a reduction in the gas temperature with a greater transmission of heat from the gas to the stock.

Under either condition, any increase in the transmission of heat from the gas to the stock would be reflected in reduced top gas temperature and/or a reduced need for charging water with the stock to protect the furnace top.

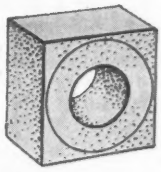
Because all top gas contains a variable amount of water vapor evolved or evaporated from the stock, its temperature leaving the furnace must exceed the evaporated water vapor dew point (212° F) in order to prevent the formation of sludge in the downcomers and dust catcher from water condensate and flue dust. A temperature of 50° F in excess of the dew point would provide an adequate margin of safety. A temperature in excess of a reasonable margin of safety is a thermal waste.

Justification for Use of Oxygen—In the light of the thermal balance data (Table VIII, Parts VIa), the air/iron and gas/iron data of Table XVIII, and the graphic illustration in Figs. 21 and 22, the advantage to furnace operation from a reduction in the blast weight and volume is obvious, so long as it can be reduced without sacrifice of the productive capacity of the furnace.

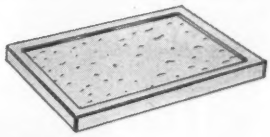
Based upon the reasoning which has been presented opinion is offered that furnace operating conditions can be created which will permit the use of oxygen-enriched air, and with it the blast volume can be reduced, iron production increased, and the fuel rate reduced, all at the same time.

Thermal conditions which can exist within a blast furnace are variable and complex, consequently they furnish an opportunity for differences of opinion regarding their effects. Over the years numerous commentators have advanced theories for improving the relationships of these conditions. Unfortunately too often the theories consider one phase of furnace operation without considering the effects from or the effects

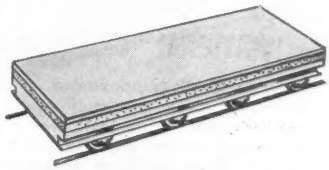
"Here's why I keep a stock of Kaocast on hand!"



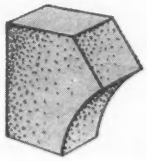
BURNER BLOCKS
Kaocast lasted 3 to 6 times as long as previous refractory. Still going strong.



DOOR LININGS
Kaocast lasted 3 to 6 times as long as previous refractory — cut installation cost in half.



TUNNEL KILN CAR TOPS
Ordinary fireclay crumbled after few trips. Kaocast lasted 30 trips without deterioration.



SPECIAL SHAPES
Kaocast special shapes cast over week-end to meet production demands.

The Chief Engineer of a mid-western power plant finds B&W Kaocast so *versatile* that he always keeps a ton or more on hand for miscellaneous jobs. This is only one of hundreds of plants in a list of diversified industries which are discovering practical, time-and-money-saving uses for this unique 3000 degree refractory castable. The panel at right gives a few examples.

There are good reasons for these Kaocast "success stories". This jack-of-all-refractories can be molded in a hurry *by you, when you need it.* It can be cast directly in place or applied by cement gun. Kaocast not only makes possible faster repairs and eliminates the need for a large inventory of special shapes, but it also stays on the job. That's because Kaocast has high resistance to spalling and slag attack, low volume change and negligible re-heat shrinkage.

Get all the data on easy-to-use, versatile Kaocast from your B&W Field Engineer. His specialized experience is an important B&W "extra".

KAOCAST is another important refractories development by B&W engineers who have continuously established new standards in industrial furnace refractories for the past 30 years.

BABCOCK & WILCOX

THE BABCOCK & WILCOX CO.
REFRACTORIES DIVISION
GENERAL OFFICES: 161 EAST 42nd ST., NEW YORK 17, N.Y.
WORKS: AUGUSTA, GA.

R-407

B&W REFRACTORIES PRODUCTS — B&W Allmul Firebrick • B&W 80 Firebrick • B&W Junior Firebrick • B&W Insulating Firebrick B&W Refractory Castables, Plastics and Mortars • OTHER B&W PRODUCTS—Stationary & Marine Boilers and Component Equipment . . . Chemical Recovery Units . . . Seamless & Welded Tubes . . . Pulverizers . . . Fuel Burning Equipment . . . Pressure Vessels . . . Alloy Castings

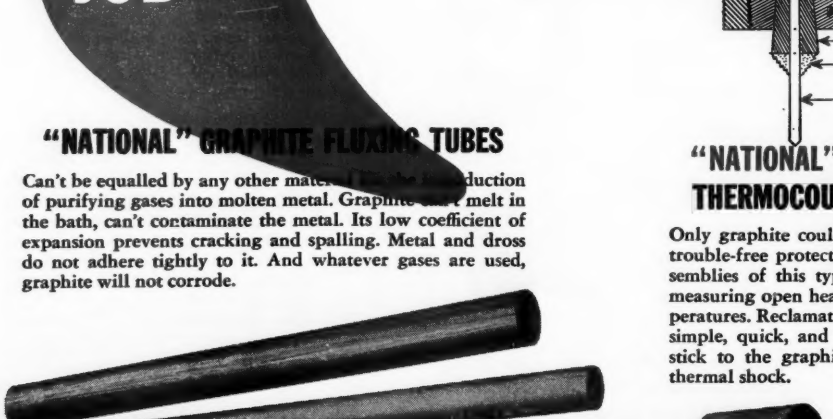
In Furnace and Foundry...

These SMALL PARTS do a BIG JOB

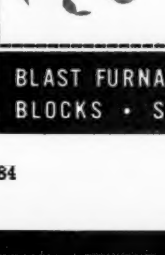
● High temperature applications of "National" Carbon and Graphite are not limited to big-tonnage items. A part of National Carbon's service is to develop *any* application, however small, where the unique properties of carbon and graphite assure a convenience and economy to the user. In the following two instances, a few *pounds* of graphite serve literally *tons* of metal . . . efficiently and at a saving.

"NATIONAL" GRAPHITE FLUXING TUBES

Can't be equalled by any other mat[illegible] duction of purifying gases into molten metal. Graphite [illegible] melt in the bath, can't contaminate the metal. Its low coefficient of expansion prevents cracking and spalling. Metal and dross do not adhere tightly to it. And whatever gases are used, graphite will not corrode.



HERE'S HOW TO LICK HY HEET



National Carbon Company
30 E. 42nd Street
New York, N. Y.

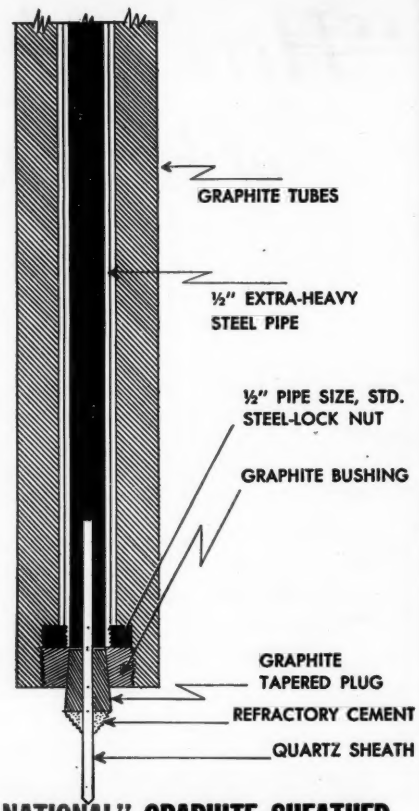
PLEASE SEND INFORMATION ON:

☐ Thermocouple Sheath Parts ☐ Fluxing Tubes

NAME_____

COMPANY_____

ADDRESS_____



"NATIONAL" GRAPHITE-SHEATHED THERMOCOUPLE ASSEMBLY (Typical)

Only graphite could provide the degree of low-cost, trouble-free protection required by thermocouple assemblies of this type for the immersion method of measuring open hearth and electric furnace bath temperatures. Reclamation and maintenance for re-use are simple, quick, and economical. Molten metal won't stick to the graphite parts and they're immune to thermal shock.

The terms "National" and "Eveready" are registered trade-marks of Union Carbide and Carbon Corporation

NATIONAL CARBON COMPANY
A Division of Union Carbide and Carbon Corporation
30 East 42nd Street, New York 17, New York
District Sales Offices: Atlanta, Chicago, Dallas, Kansas City, New York, Pittsburgh, San Francisco
IN CANADA: National Carbon Limited
Montreal, Toronto, Winnipeg

LOW LIGHT BILLS . . .

. . . mark phenomenal acceptance of "EVEREADY" No. 1050 Industrial Flashlight Batteries by a broad cross-section of industry. Delivering twice the usable light of any battery we've ever made before, it will not swell, stick or jam in the flashlight . . . has no metal can to leak or corrode.

BLAST FURNACE LININGS • BRICK • CINDER NOTCH LINERS • CINDER NOTCH PLUGS • SKIMMER BLOCKS • SPLASH PLATES • RUNOUT TROUGH LINERS • MOLD PLUGS • TANK HEATERS

on other phases and therefore they are impractical for use. Some of the theories which have been advanced in the interests of oxygen enrichment of natural air are analyzed from the writer's conception of the problem;

1. **Theory**—The use of oxygen-enriched air will increase the temperature in the hearth and consequently increase the smelting rate.

Comment—The use of oxygen-enriched air will increase the heat volume generation but will not increase the temperature unless there is a confinement or concentration of the heat volume. The temperature in the hearth in excess of minimum requirement for forming slag is thermal waste and, therefore, most undesirable. Temperature in the hearth and bosh in excess of the minimum requirement will increase the gas velocity and the temperature entering the shaft; consequently, it adversely affects the raw material preparation capacity—the vital necessity for obtaining the benefit from oxygen enrichment of air. Increase temperature in the hearth cannot increase the smelting rate unless more material is prepared for smelting. Without this increase the blast temperature would have to be reduced in order to meet the iron chemical specification and thus defeat any benefit from oxygen-enriched air.

2. **Theory**—Oxygen-enriched air will correct thermal deficiency in the hearth because all furnaces can prepare material faster than they can smelt it.

Comment — Virtually all blast furnaces in the United States and elsewhere, which use raw materials containing appreciable percentages of volatile constituents, cannot prepare raw material as rapidly as the bosh and hearth can smelt it because of mechanical action governing the gas disposal through the stock column and the effect of it upon the efficient transfer of heat from the gas to stock. Witness the inability of most furnace operations to continuously use high blast temperature as for example above 1200° F.

3. **Theory**—Use of oxygen-enriched air will correct stock movement in a "hanging" furnace.

Comment—This claim is open to question. But where a furnace is thermally deficient in the hearth and bosh and therefore able to consume additional heat, it will not hang.

4. **Theory**—Secondary introduction of oxygen into the gas stream within the furnace at some elevation above the tuyeres in order to increase the heat generation with the combustion of CO to CO_2.

Comment—Aside from the fact that in most furnace operations the principal thermal problem is one of distribution and transmission of heat rather than generation of it, the secondary introduction of oxygen would destroy the uniformity in the stock preparation because of the localized distortion in temperature at the point or points of introduction. The same thought applies to the secondary introduction of cool inert gas at the mantle to average down the temperature in the shaft. In addition to localized excessive cooling action any increase in the gas volume or weight would magnify the problem of gas disposal through the stock column.

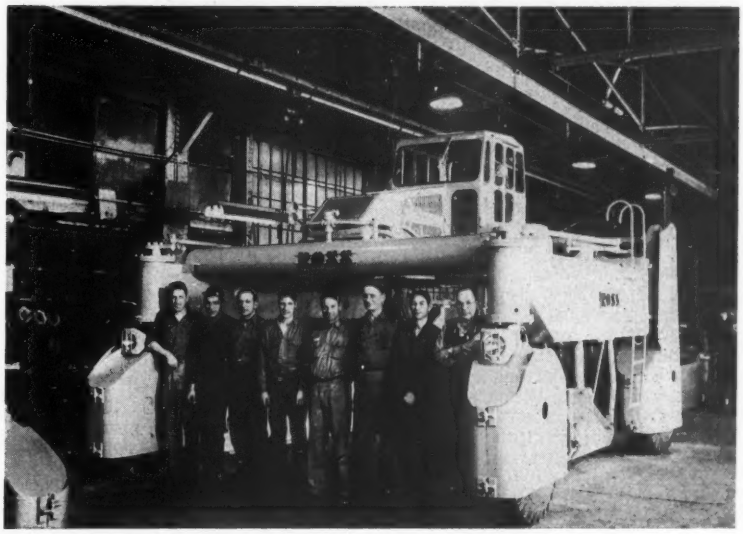
5. **Theory**—Use of oxygen enriched air would obviate the need for blast furnace stoves.

Comment—Since principles of carbon combustion within the blast furnace permit the generation of less than 1/3 the potential (CO_2 = 14,580 Btu/lb C − CO = 4370 Btu/lb C), the failure to utilize the maximum possible recovery of latent heat from to gas (CO) constitutes thermal waste. Unless oxygen enrichment is considered only as an auxiliary to the blast heat, the thermal economy of the furnace operation will be adversely affected.

It may be said the one unalterable condition governing the successful use of oxygen-enriched air in an iron blast furnace operation is the necessity of having the bosh and hearth smelting capacity thermally deficient in relation to the shaft raw material preparation capacity. Various degrees of deficiency may be created through beneficiation of natural raw materials, through adjustments in slag mineral composition, or through a combination of both, the means of creation being immaterial to the necessity. So long as the necessary thermal condition is met any variation in the degree of it can be utilized or met with adjustments in the percentage of oxygen enrichment, blast temperature, and the blowing rate. Because of the certain effect of oxygen enrichment of air on the stock travel rate when the optimum percentage of enrichment has been determined, it should be held constant with adjustments necessary to meet any minor variable thermal requirements being made in blast temperature and the blowing rate.

Why Deficiency Arises—Degrees of attainable deficiency in the smelting capacity are illustrated with comparison of raw materials used at furnace operations discussed in this series of articles. Blast furnace raw materials anywhere will be within the range of the chemical composition existing in these materials.

1. At South, the elimination of



Moving Unwieldly Cargos by Straddle Carrier

Lukens Steel Co. meets the problem of moving unwieldly cargos of steel plate with this Ross series 100 straddle carrier. Machine handles material 124 inches wide, 72 inches high, any length and can tote loads up to 45,000 pounds. Six-cylinder 140-hp gasoline engine powers the carrier. Four-wheel steering and brakes, as well as load lifting mechanism, are fully hydraulic

all volatile matter from the raw materials before charging would appreciably decrease the shaft thermal work and the need for heat delivery to the shaft. Consequently, the blowing rate could be reduced. The ratio of preparation to smelting capacity would be increased in direct proportion to the work decrease. However, since the elimination of volatile matter alone would not change the existing ratio to each other of the slag forming constituents, the conditions governing the slag formation and the influence of the slag mineral composition on the development of the bosh temperature head, would not be changed. Although the oxygen-enriched air could be used to some degree, the extent would be limited to the percentage of enrichment which would not create an excessive bosh temperature head. Only the concentration of iron oxide from the natural ore, the reduction in the ore gangue charged to the furnace, and the use of lower ash coke, could change the slag composition and the thermal effects from it beyond the range indicated in Fig. 19.

2. For the Lake ore operation indicated in Fig. 20 the effect upon the bosh and hearth thermal conditions from the adjustment in slag mineral composition alone has been illustrated. The adjustment would permit the use of oxygen-enriched air to a limited degree. The elimination of all volatile matter from the raw materials before charging would proportionately increase the ratio of preparation to the smelting capacities and the oxygen-enriched air could be used to an increased degree. Concentration of iron oxide from natural ore, or blending of volatile bearing ore with iron rich ore concentrates (example—taconite concentrates and Mesabi ore) would produce a product which would further increase the ratio of preparation to the smelting capacity and permit a further increase in the percentage of oxygen enrichment of air.

3. Iron-rich, volatile-free materials used at East approach the ultimate in raw material beneficiation for shaft preparation work. The illustration of the bosh and hearth thermal relationships (Fig. 19) approach the ultimate in the benefit from slag mineral composition. With such conditions the limitation to the percentage of oxygen enrichment would be reached only when the burden weight and the stock travel rate in relation to the gas weight produced (the shaft heat distribution agent) would cause the shaft preparation capacity to become deficient in relocation to the bosh and hearth smelting capacity. The East practice data indicate the use of maximum available blast temperature. Oxygen-enriched air would increase, support, and/or protect the vital bosh temperature head. With the protection the ore/coke burden ratio could be increased until the shaft preparation capacity was exhausted. However, until it is exhausted any increase in the ore/coke burden ratio would proportionately increase the iron production and reduce the fuel rate.

Looking for a Market

CAN YOU use a low-cost, light weight, granular mineral that can't burn, is an efficient insulator and flows as freely as popcorn?

That's what the Zonolite Co., Chicago, wants to know. Finding new industrial uses for this expanded, mica-like material is the goal of a research program now getting under way.

As an aggregate in concrete it provides 12 to 16 times the insulating value of ordinary sand concrete.

It also is used as a packing material for breakable, perishable and inflammable materials. It is used in the controlled cooling of molten metals and glass. Currently it is being used to insulate red hot steel ingots during railway shipments in Canada.

The South and Lake ore furnace operations having the conditions cited could benefit from the use of oxygen-enriched air to the degree of thermal deficiency created in the smelting operation.

When To Use Oxygen—Viewing blast furnace operation as a science it may be said that there is no justification for the use of oxygen-enriched air where the thermal deficiency in the smelting operation exists or has been created so long as sufficient blast heat can be made available to serve the smelting needs, because the use of this recovered heat is always a direct credit to the thermal economy. However, the permissible dome temperature in blast furnace stoves, which is consistent with economical stove maintenance costs, places a limitation on the top gas latent heat recovery. When this source of heat becomes exhausted oxygen-enriched air would become a valuable supplement.

From the viewpoint of commercial economy conditions may exist where the cost of blast heat (adequate stove capacity) may be greater than the cost of oxygen-enriched air. With such conditions increased iron production may be of greater commercial value than the ultimate in fuel economy. Also, because the iron oxide in Lake ore is so finely disseminated throughout the body of the ore, any mechanical separation of it from the gangue to the degree practiced with Eastern magnetite ore is extremely difficult. Blending low-grade Lake ore hematite with highly concentrated taconite in a sintering operation would eliminate the volatile matter from the hematite ore and benefit the physical properties of the finely ground taconite concentrate. Use of the product of the blend with oxygen-enriched air would provide a blast furnace operating practice method which could economically smelt the low-grade ores of the Lake region[20].

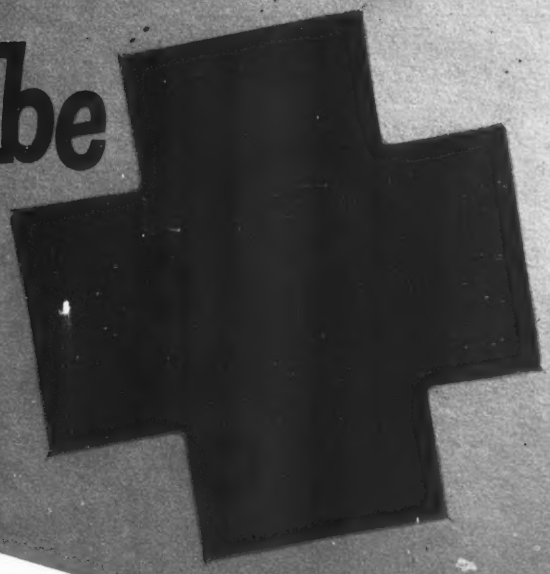
Conclusion—Because the great majority of blast furnace operations in the United States have obtained their raw materials from the same sources (Lake ores and Middle West coals) for close to a century, and have led the world in furnace practice with development of practice methods applicable to those materials, distinction between operating principles and practice methods has possibly become somewhat obscured without changing the truth of the existing difference. History of 200 years of American furnace operation repeatedly furnishes evidence of the necessary change in practice methods as the character of raw materials changed, in order to serve the basic operating principles which never change. In this series of articles attempt has been made to indicate eras when major changes occurred, and cause for the occurrence.

The present problem of obtaining iron ore, which can be smelted economically, is simply a re-occurrence of similar problems of raw material supply, both ore and fuel, with which past generations had to contend. In proportion to the size of the industry the problem of the present era probably is not any greater than similar problems in past eras, and, to the extent of having a vast amount of reliable research data available for study

you could be minus

(THE EQUIVALENT OF)

2761 blanks this size



A sheet of exactly .025" strip steel the size of this page (8¼" x 11¼") weighs approximately $10\frac{47}{64}$ ounces.

The same size sheet of .027" (.025", .002" over size) with the blank punched out would weigh the same.

in every ton if the .025" strip steel you order actually measures .002" oversize

footage loss increases as thickness increases; decreases as gauge decreases.

KEEP ON THE PLUS SIDE

CMP THINSTEEL

the precision gauge tolerance of protects you against such costly losses, insures maximum practical yield per ton

the Cold Metal Products co.

YOUNGSTOWN 1, OHIO

New York • Chicago • Indianapolis • Detroit • St Louis • Los Angeles • Cleveland

See next page for list of THINSTEEL products.

To keep your production on the plus side, you can always count on CMP Thinsteel delivering more feet per pound, more finished parts per ton. Many other cost-saving possibilities can be yours with Thinsteel, too, such as bright annealed chrome-nickle Stainless Strip that substantially eliminates polishing expense, or, non-scalloping quality carbon strip to banish or reduce trimming operations. Yes, many unusual and exclusive advantages that can help you control end product quality in a highly competitive market. We welcome your inquiry and invite your investigation by sampling and testing CMP cold rolled strip steel products; regularly produced in Low Carbon, High Carbon Spring Steel, Stainless, Alloy, Tempered Spring Steel and Electro Zinc-coated.

CMP THINSTEEL products can be ordered direct from the mill, or for less than mill quantities or for emergency service needs, from following warehouses:

The Kenilworth Steel Company, 750 Boulevard, Kenilworth, New Jersey, 'phone N. Y. COrtland 7-2427 or N. J. UNionville 2-6900.

Precision Steel Warehouse, Inc., 4409-4425 West Kinzie Street, Chicago 24, Illinois, 'phone COlumbus 1-2700.

The Cold Metal Products Company of California, 6600 McKinley Avenue, Los Angeles, California, 'phone PLeasant 3-1291.

the Cold Metal Products co.

YOUNGSTOWN 1, OHIO

New York • Chicago • Indianapolis • Detroit • St. Louis • Los Angeles • Cleveland

of the problem, which past generations did not have, it is not as great. With the exception of the Eastern district the ore supply for the majority of United States furnaces was solved with the development of new sources of iron ore which could be used economically in the natural state. Experience of the Eastern district indicates how overall economy of furnace operation can be improved through the beneficiation of low-grade ores.

History of the fuel problem, in transition from wood charcoal to by-product bituminous coke, indicates a period of approximately 75 years. The rapid depletion of the better grades of coking coals in the United States, and the need for beneficiation of lower grades to replace them, is simply another phase of the older fuel problem.

Program Is Urgent — Because nature so bounteously endowed the United States with iron rich ore, which could be mined at low cost (Lake ores), the need for an intensive benefication of low-grade ores for the majority of our furnace operations has not been urgent until the present era. But since it has become urgent, it need not be looked upon as an economic evil but rather as an opportunity for another forward movement in the art of producing metallic iron, comparable in scope to the advancement made during the transition in the fuel era, with the exception that because of the lessons of the past, steps in the advancement can now be made with greater rapidity and assurance of success.

History of past furnace operation teaches the importance to operating economy of the raw material thermal requirements and effects, with regard to both productive capacity and the fuel rate. Because of the abundance of natural high-grade ore and coal, which the United States furnaces have enjoyed for 75 years, they have been profligate in their use, and because of it, now that need for beneficiation of low-grade materials has become urgent, stress should be placed on the importance of providing beneficiated products with which thermal requirements and effects can be most efficiently served. Elsewhere it was said that the development of the American blast furnace industry has been greater in perfection of mechanical equipment for more efficient application of heat to natural raw materials than it has been in the preparation of natural raw materials for a more efficient reception of heat, or in understanding the effects of the chemical composition of materials on the efficient use of heat. The comment is repeated because the thought contained therein is the crux of any raw material beneficiation program. An ore rich in iron is not necessarily the most desirable one, because if not accompanied with slag-forming constituents in the proper ratio to each other, and to the coke ash, heat cannot be utilized to the best advantage of the furnace operation.

The End

Long Lift, Short Truck

Light, short truck is used to demonstrate a 136-inch telescopic lift. The truck, a product of Automatic Transportation Co., Chicago, is one of eight designed by the firm to reduce weight 25 per cent from previous models. Called model C Transtacker, series handles loads 500-1000 pounds

More Standards Added

Useful to industry as a whole is the new edition of "Standards of Tubular Exchanger Manufacturers Association." This third edition of the book is a complete revision of the first two.

Complete mechanical standards for alloy steel construction are incorporated, as well as the standards for carbon steel and nonferrous alloy construction. In addition, a general information section has been added.

The section brings together helpful data and tables on maximum allowable stress values of carbon, low and high alloy steels, nickel and high nickel alloys, copper and copper alloys, carbon and low alloy steel pipe and tubes.

Longer Life for Pipe

Rubber lining for pipe, fittings, process equipment eliminates corrosion

DEVELOPMENTS in lining and covering pipe, fittings and process equipment with rubber, originated by La Favorite Rubber Mfg. Co., Paterson, N. J., now permit applications which company states reduce maintenance costs and prolong useful life of pipe-line and process equipment.

Before this method was used on pipe, it was necessary to break a line for insertion of fittings to provide a change in flow. Insertion of fittings was usually impossible in marine and industrial installations where close clearances in limited space were encountered.

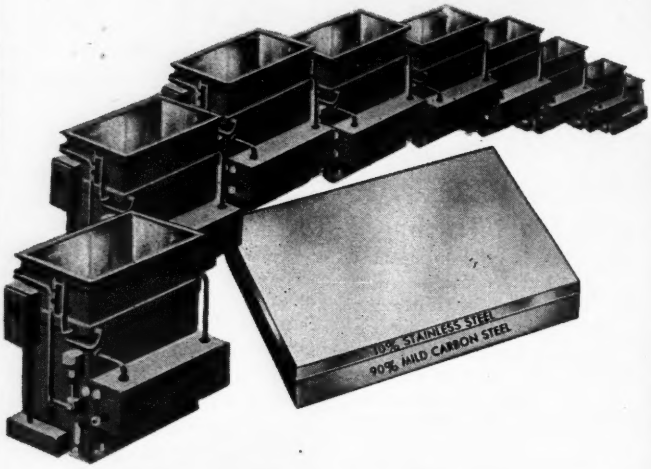
More Bends—Special designs of bent pipe and shapes can be lined with rubber without risk of processing failure. It has been recommended practice to place a limit of two 90-degree bends for each connected length of pipe. It is now possible to apply lining on three 90-degree bends in a single length of pipe as small as 4 inches in diameter. Manufacturer claims that failure at bends in pipe are completely eliminated.

An installation is cited on a vessel for a large steamship company. Brass pipe and fittings were being constantly replaced because of the breakdown due to electrolytic action in the circulating sea water lines used for cooling purposes on engine room equipment.

Resists Salt Water — Substitution of rubber-lined steel pipe completely eliminated any adverse effect on these lines. Marine growth built up is inhibited and abrasion and corrosion by the brackish water, which caused previous failure has had no effect on the rubber linings.

How to Make Stainless Protection Go NINE TIMES FURTHER... with PERMACLAD

STAINLESS CLAD STEEL



Want stainless protection for your product or equipment—without wasting stainless steel? You'll get it at low cost—with PERMACLAD!

A 10% layer of stainless, inseparably welded to a 90% mild steel backing, gives PERMACLAD the surface characteristics of solid stainless *and* the easy forming qualities of carbon steel. This means real savings in corrosion resistance and in fabrication as well. For you can cold-form PERMACLAD with ease, draw it deeper without intermediate annealing, actually form it into products impossible with many other materials.

Even with the most severe draw, the percentage of cladding (which can be 20% or more if desired) never varies. And the stainless layer remains inseparably welded to its backing. For gleaming, stainless products and corrosion resistant equipment, design and build with PERMACLAD. The coupon below brings you full details in our new 8-page folder (P-85).

Send for Free Folder Today

FOR BETTER PRODUCTS AT LOW COST . . . SPECIFY PERMACLAD

A.W. PERMACLAD

STAINLESS CLAD STEEL

STEEL SCRAP FIGHTS FOR DEFENSE. SELL YOUR SCRAP NOW!

ALAN WOOD STEEL COMPANY Conshohocken, Pa.

Over 125 Years of Iron and Steel Making Experience

Gentlemen:
I am interested in stainless protection with PERMACLAD.
Please send me full information and new, free folder (P-85).

*Name*_____ *Title*_____

*Company*_____

*Address*_____ *City*_____ *State*_____

Other Products: A.W. ALGRIP ABRASIVE Floor Plate • A.W. SUPER-DIAMOND Floor Plate • Plates • Sheets • Strip • (Alloy and Special Grades)

Faster Hydrogen Analysis

HYDROGEN CONTENT of steel can be analyzed in a procedure that takes only about 15 minutes.

Office of Naval Research, for whom the commercially practical technique was developed, reports the analysis is as simple as standard tests for carbon, sulphur or manganese content. Work was done for the Navy by scientists at Massachusetts Institute of Technology.

How Much Tolerated—Hydrogen gas present in steel is a well-settled cause of porosity and brittleness. Seeking ways to overcome the defects, Naval Research first took steps to determine how much carbon can be tolerated before its effects become objectionable.

This, in turn, required a simple and quick technique for determining hydrogen content. Analytical apparatus developed obtains precision of one part per million for a 2-gram sample.

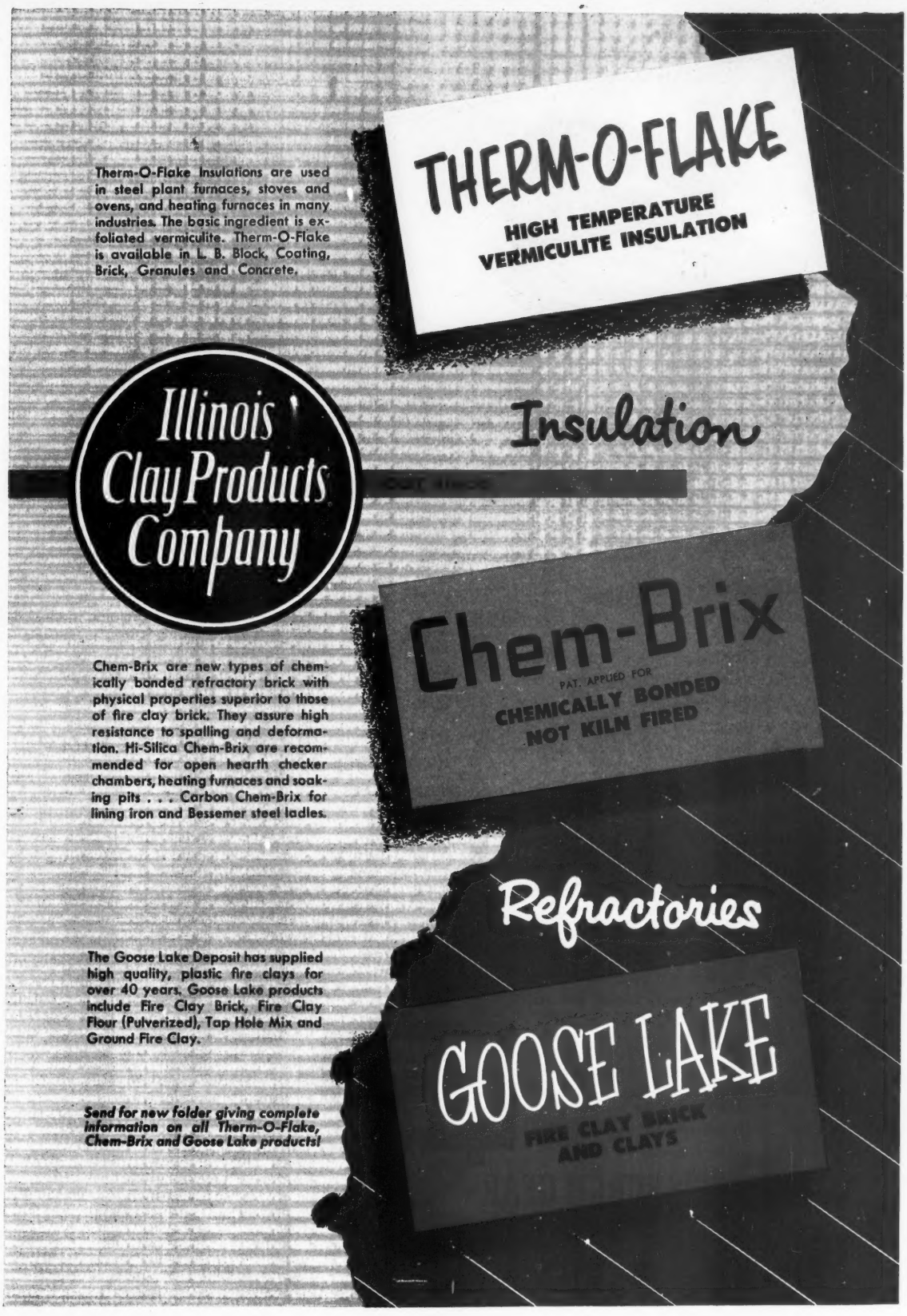
True Picture—Another difficulty was keeping the liquid steel sample so the analytical results will be a true picture of the sample's hydrogen content. To solve this problem, the scientists developed an induction-heated apparatus in which the liquid metal can be kept under a controlled atmosphere. Samples can be withdrawn without exposure to air.

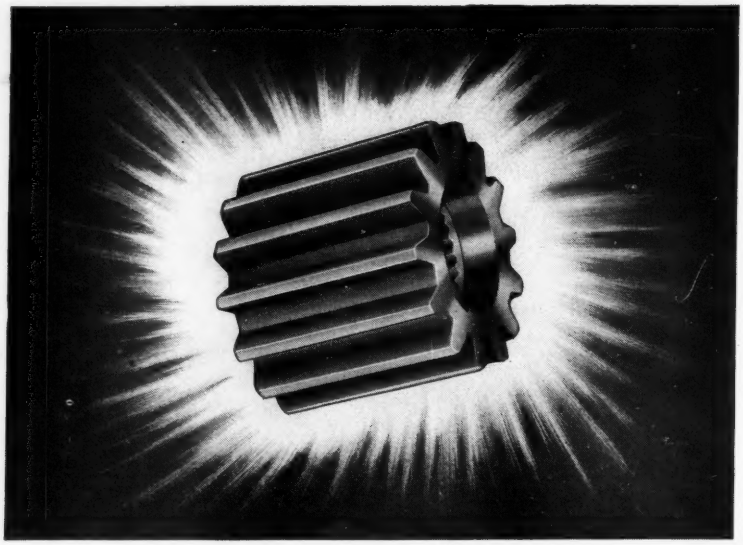
The Navy reports this analytical technique and sampling procedure together are proving well suited to process control of hydrogen in commercial furnaces.

How To Use Aluminum

Guidebook for making better use of aluminum has just been made available to U. S. industry by the Office of Technical Services, U. S. Department of Commerce. Entitled "Aluminum Symposium," book contains a record of technical papers delivered at a symposium on aluminum held at the Army's engineer research and development laboratories, Fort Belvoir, Va.

Alloys castings of aluminum and their properties as a structural material are given in one of the papers. Various techniques for forming aluminum are discussed in another paper. A related appendix gives detailed data. Other papers included in the compilation cover


THERM-O-FLAKE
HIGH TEMPERATURE
VERMICULITE INSULATION
Therm-O-Flake Insulations are used in steel plant furnaces, stoves and ovens, and heating furnaces in many industries. The basic ingredient is exfoliated vermiculite. Therm-O-Flake is available in L. B. Block, Coating, Brick, Granules and Concrete.
Illinois Clay Products Company
Insulation
Chem-Brix
PAT. APPLIED FOR
CHEMICALLY BONDED
NOT KILN FIRED
Chem-Brix are new types of chemically bonded refractory brick with physical properties superior to those of fire clay brick. They assure high resistance to spalling and deformation. Hi-Silica Chem-Brix are recommended for open hearth checker chambers, heating furnaces and soaking pits . . . Carbon Chem-Brix for lining iron and Bessemer steel ladles.
Refractories
GOOSE LAKE
FIRE CLAY BRICK
AND CLAYS
The Goose Lake Deposit has supplied high quality, plastic fire clays for over 40 years. Goose Lake products include Fire Clay Brick, Fire Clay Flour (Pulverized), Tap Hole Mix and Ground Fire Clay.
Send for new folder giving complete information on all Therm-O-Flake, Chem-Brix and Goose Lake products!



This Pittsburgh Purple ARMORED Gear might save you a good many dollars

Increasing gear life may be a real problem for you but it's our business. It is something we do by combining design, metal, and machining with a special heat-treating process and experience we have gained making quality gears since 1914.

The PITTSBURGH Armoring process puts the right hardness in the right places. It makes the wearing surfaces hard but leaves the core tough and shock-resistant. **Armored Gears** are so good that we guarantee them to give you longer service.

By changing to PITTSBURGH **Armored Gears** in a product you make, or on a machine you use, you might save a good many dollars. Our engineers will gladly consult with yours to work out a solution. Write us today for prompt attention.

Look for the "**Pittsburgh Purple**" protective coating on the gears you buy.

SPUR
MITRE
HELICAL
HERRINGBONE
WORM GEARS
REDUCERS
CRANE WHEELS

Your Guarantee of Longer Life

PITTSBURGH GEAR COMPANY
27th & Smallman Streets
Pittsburgh 22, Pa.
Phone: ATlantic 1-9950

subsidiary of BRAD FOOTE GEAR WORKS, INC. • CICERO 50, ILLINOIS

Cast in Stainless

BLADES for the four 35,000-hp, Kaplan adjustable-blade turbines currently being built by Baldwin-Lima-Hamilton Corp., Philadelphia—eventually to end up in two plants of the Nangal hydroelectric project in East Punjab, India—are said to be the largest stainless steel blades yet cast.

To prevent work hardening of the stainless steel from dirt particles, which might become embedded in the bearing, blade trunnions are machined undersize (STEEL, p. 140, June 2) to fit sleeves of a different metal. The sleeves serve as journals in the hub bearings. Baldwin-Lima says ultimate capacity will be three units in each plant.

recommendations for best results in machining aluminum; welding, brazing, soldering, resin bonding, cold welding and riveting; corrosion of aluminum and the measures used to protect against it; design in aluminum extrusions including cost factors and manufacturing limits.

The publication is available through the department.

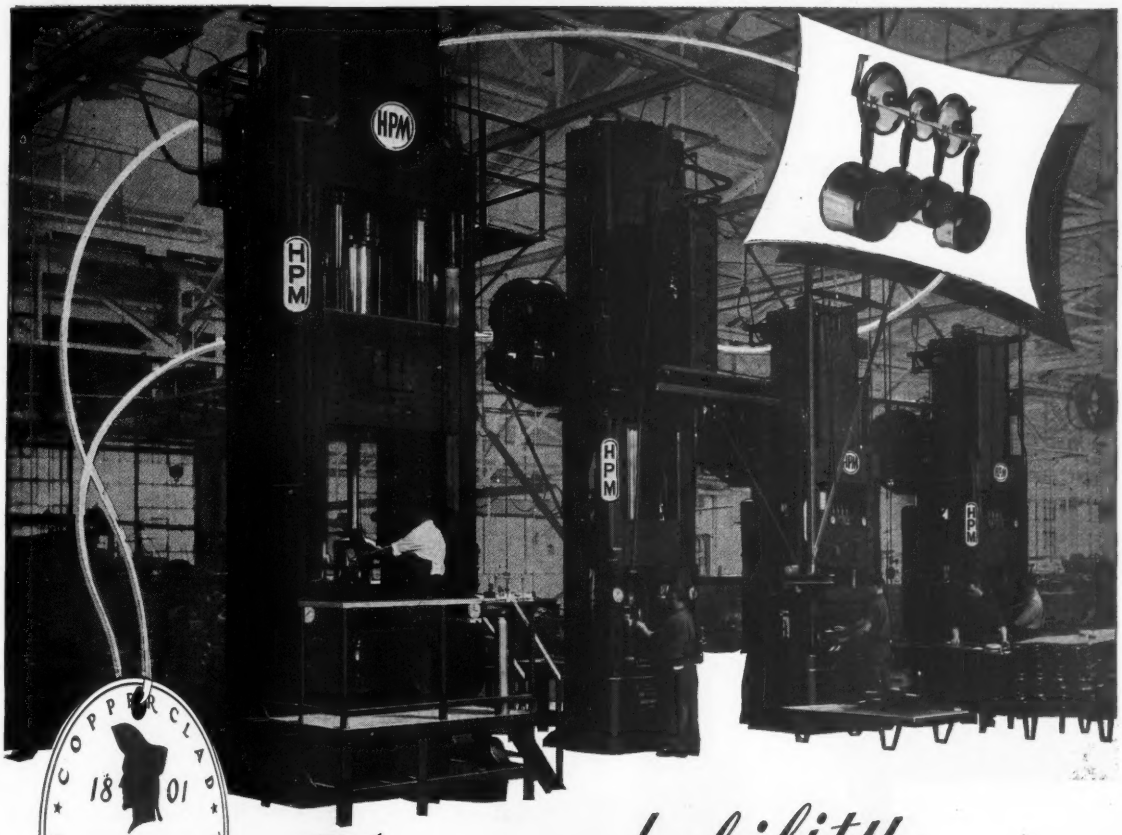
Index to Circuit Data

IMMEDIATE — and correct — answer to questions like, "What's the number of this circuit?" or "Where is the panel that serves it?" can be vital to preventing loss of time or equipment.

Among the many systems available to provide these answers, one of the most efficient is a plastic tape developed recently by Labelon Tape Co. Inc., Rochester, N. Y. Product provides space for noting all necessary circuit data and can be applied directly to panels, circuit breakers, switches, fuses, wall outlets and used as flags on wires and drop cords.

No Moistening—Tape is pressure sensitive. It sticks to any dry and comparatively smooth surface without moistening.

Use of a pencil to make impressions is permissible, but unnecessary. Any pointed instrument serves the purpose, because the impression appears beneath a transparent plastic outer layer



COPPER CLAD STAINLESS STEEL
18 01
REVERE WARE

Dependability

. . . A PROVEN FACT WITH H-P-M

The dependability of H-P-M presses has been proven time and time again! Yes, building presses has been going on at H-P-M for three quarters of a century . . . and dependability is an unwritten part of the specifications you can count on us to continue.

H-P-Ms have contributed to many success stories. An excellent example is the line of H-P-M presses above . . . part of a 10 press operation at Rome Manufacturing Division of Revere Copper & Brass, Rome, New York. This installation is typical of the several H-P-M FASTRAVERSE press operations in other Revere plants. Because of the outstanding, on-the-job performance of H-P-M presses, Revere has installed over 20 H-P-Ms to keep pace with the increasing demand for the popular Revere Ware.

At H-P-M you will find a quality-minded organization, modern factory equipment and the most advanced production techniques. Proven *dependability* is inherent in every H-P-M press . . . it is the result of H-P-M's 75 years of specialized experience in the field of hydraulics. Whatever your production problem, you'll benefit by this experience. Invite us in at the planning stage, won't you?

HPM 75th YEAR

THE HYDRAULIC PRESS MFG. COMPANY

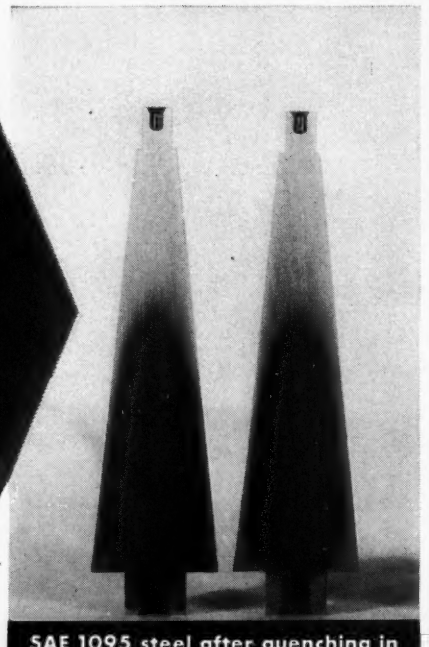
1044 MARION ROAD

MOUNT GILEAD, OHIO, U.S.A.

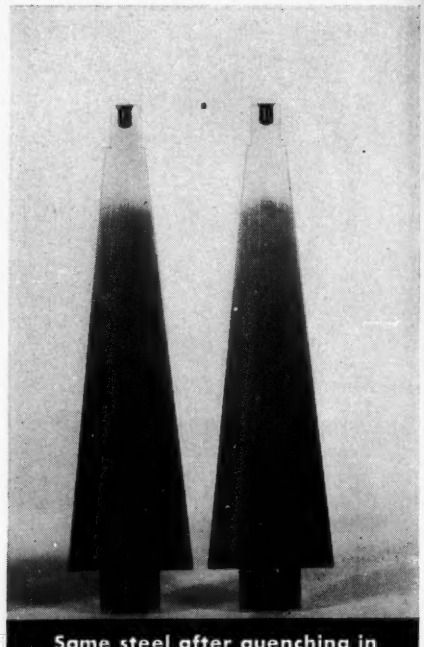
Builders of Presses for the Metal Working & Processing Industries • Plastics Molding Presses • Die Casting Machines • Hydraulic Pumps, Valves & Power Units

It's a better quench with GULF SUPER-QUENCH

these cones tell the story



SAE 1095 steel after quenching in **GULF SUPER-QUENCH**



Same steel after quenching in **CONVENTIONAL QUENCHING OIL**

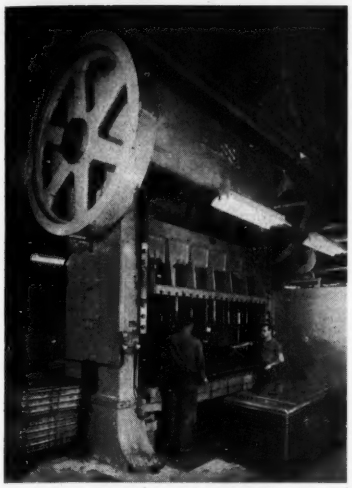
dual quenching action makes the difference:

1. **deeper hardening**
2. **more uniform hardening**
3. **minimum distortion**

Gulf Super-Quench can help you offset lower hardenability in today's substitute steels. Ask a Gulf Sales Engineer for additional information. Write, wire, or phone your nearest Gulf office today.

GULF SERVES INDUSTRY

Gulf Oil Corporation
Gulf Refining Company
Pittsburgh 30, Pa.



Stamping Flexibility

Greater flexibility in metal stamping production at Leake Stamping Co. results from installation recently of this 500-ton Bliss double crank mechanical press. The Monroe, Mich., firm employs the press here to do a trim, pierce and hole cut operation on a 3 x 6½-foot vending machine door panel

that protects it against smudging or effects of water and chemicals.

Leaves No Mark—Temperatures between minus 40° F and 160° F have no effect on composition. It will not fade. When stripped off one surface and applied to another, it leaves no mark and loses no adhesive quality.

Additional uses suggested include labeling on tools, dies and tool cribs, repair parts, laboratory apparatus and packages.

Finishing Costs Down

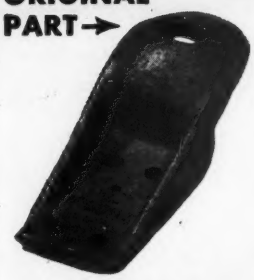
Inert arc equipment halves stainless finishing costs at Cherry-Burrell

INERT ARC welding cuts stainless finishing costs 30 to 50 per cent at Cherry-Burrell Corp.'s Little Falls, N. Y., plant.

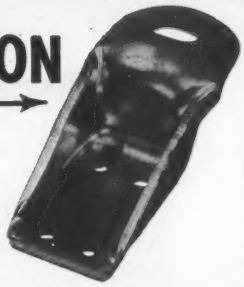
The firm makes stainless steel coolers, processors, farm tanks and pumps. Because of the precise specifications required, they report finishing operations traditionally have accounted for two-thirds of total fabricating costs. They estimate adoption of the General Electric Fillerweld equipment nearly halves this cost factor.

Smoother Weld—Welder allows

ORIGINAL PART →



CONVERSION →



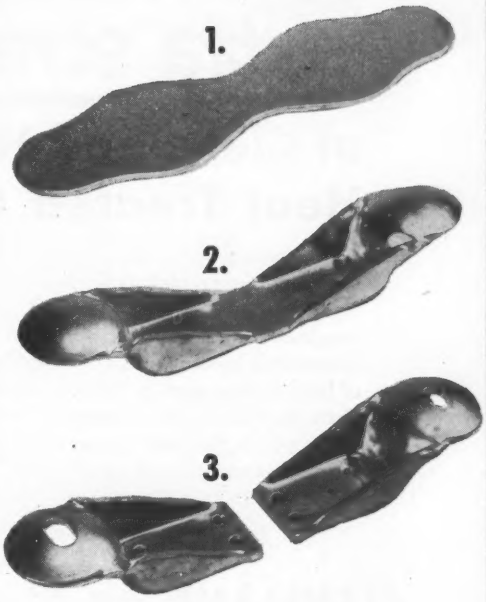
NO MACHINING
NO DRILLING
LESS WEIGHT · TIME · COST

LEAKE *Created** Metal Stampings

*RESEARCH · DESIGN · ENGINEERING
PRODUCTION / DIE MAKING · COMPLETE PRESS ROOM · MACHINE SHOP
HEAT TREATING · ALL TYPES BRAZING AND WELDING
TESTING AND INSPECTION

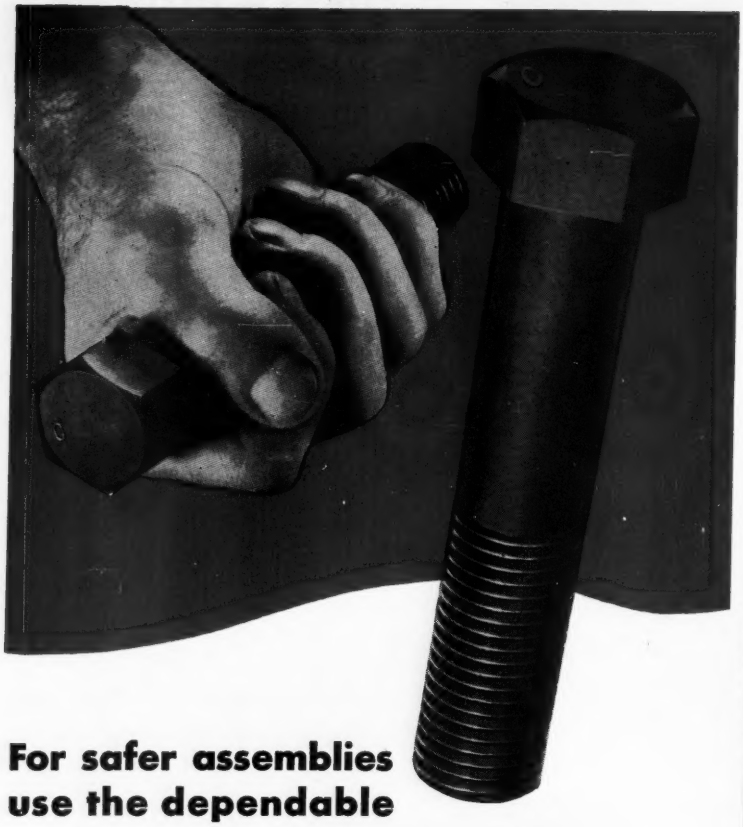
Many outstanding examples of Leake metal stampings have been *conversions*. In practically every instance *big savings* have been made in metal, time, and costs.

WRITE! Get your copy of the book "How Modern Stamping Techniques Can Help Conversion". FREE —when requested on your letterhead.



Look to LEAKE for *unusual* metal stampings!

THE LEAKE STAMPING COMPANY
MONROE, MICHIGAN



For safer assemblies use the dependable

extra strength

of Cleveland High Carbon Heat Treated Cap Screws

● For assembly jobs needing fasteners of high tensile strength, it pays you to use popular Cleveland High Carbon Heat Treated Cap Screws—those accurately formed, extra strong screws. They're toughened by heat treating—but that's not the whole story of their dependable holding quality. They're notably *stronger* because made of high carbon steel by the Cleveland-developed Kaufman *Double Extrusion* Process of cold forging—a method that assures you fasteners in which the steel's grain flow conforms to the contour of the screw. Controlled high temperature hardening and drawing give them the extra benefits you expect from heat treated parts. Be sure to specify and buy Cleveland High Carbon Heat Treated Cap Screws.

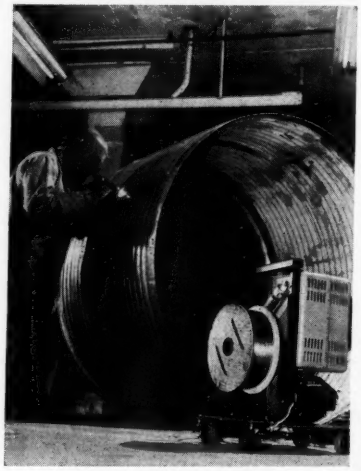
CLEVELAND *Top Quality* FASTENERS

THE CLEVELAND CAP SCREW COMPANY
2935 East 79th Street, Cleveland 4, Ohio
Warehouses: Chicago • Philadelphia • New York • Providence
originators of the Kaufman DOUBLE EXTRUSION Process
Ask your jobber for Cleveland Fasteners

the operator to control a continuous flow of filler metal automatically through a finger switch mounted on the torch. This produces a smoother and less metal-consuming weld.

Previously, considerable excess metal, added to each weld, had to be removed with a 36-grit grinding wheel. The weld then was polished with a 90-grit wheel. Effect of the new setup on this excess is illustrated by Robert F. Mager, process engineer at Cherry-Burrell. He reports a reduction that usually proves sufficient to permit first finishing with the 90-grit wheel.

Free from Porosity—In addition, welds on sanitary vessels must be



LESS EXCESS WELD
. . . 90-grit wheel used to start

free from porosity and pinholes. If pinholes are filled after the polishing operation, it means more finishing expense. According to Mr. Mager, this prospect presents little difficulty now, because the new unit leaves almost no pinholes.

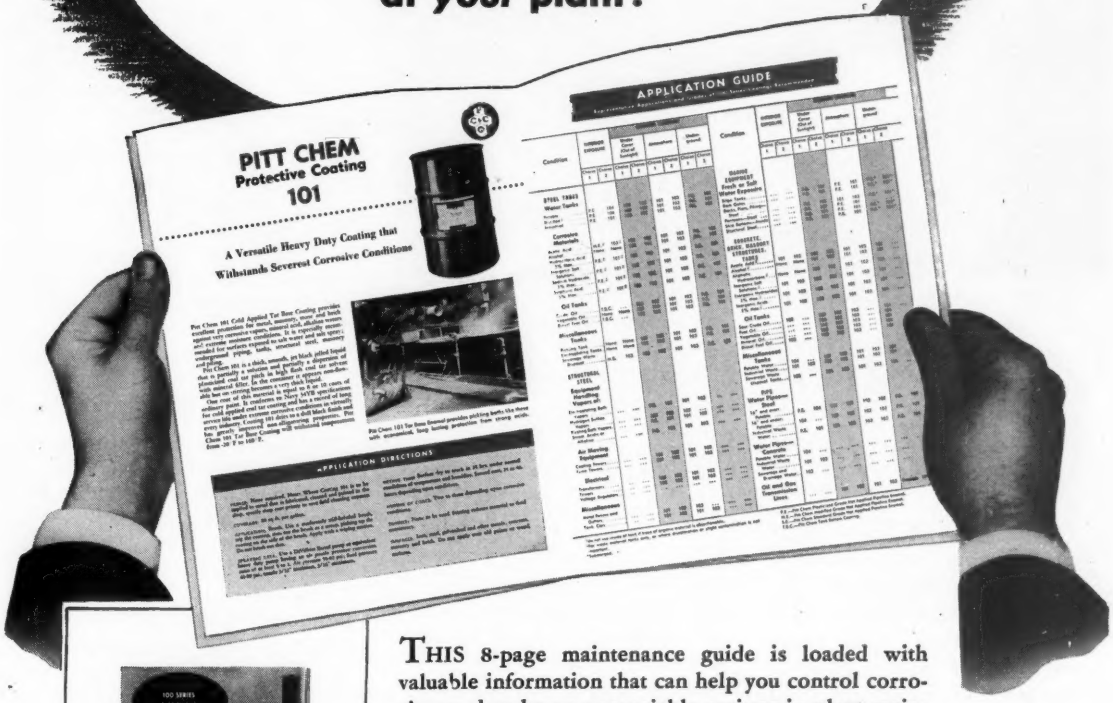
Fillerweld gun is designed for use with gas shielded arc welders. Basically, it is a manual inert-arc tungsten holder with control switch and gear assembly added for pulling the filler metal from the spool through the gun to the arc.

How It Works—Operator presets the desired filler wire speed by adjusting a rheostat, then strikes the arc as through it were a normal inert arc torch. When a molten pool is established in the base metal, he pulls the trigger on the gun, feeding the wire into the arc.

To stop the wire feed at any

Free Booklet

tells how Tar Base Coatings can cut maintenance costs at *your* plant!



THIS 8-page maintenance guide is loaded with valuable information that can help you control corrosion and make an appreciable savings in plant maintenance. It tells you *where* cold applied tar base coatings can give your plant better protection at less cost . . . what grades should be used for specific applications . . . and instructions for application by brush or spray. ● Drop us a line on your company letterhead and we'll send you a copy without cost or obligation. *Write today!*

PITT CHEM 101
A versatile, heavy duty coating that withstands severest corrosive conditions.

PITT CHEM 102
A thin, high gloss maintenance coating for steel and concrete surfaces.

PITT CHEM 103
A heavy duty coating for metal exposed to corrosive vapors, dilute acids and alkalis.

PITT CHEM 104
A fast drying, high gloss coating for equipment handling potable water.

WAD 4194

PROTECTIVE COATINGS DIVISION

PITTSBURGH
COKE & CHEMICAL CO.
Grant Building • Pittsburgh 19, Pa.

COAL CHEMICALS • AGRICULTURAL CHEMICALS • PROTECTIVE COATINGS • PLASTICIZERS • ACTIVATED CARBON • COKE • CEMENT • PIG IRON

Cuts 100 hour packaging job to 40 hours!

This 60% savings in packaging time is only part of the story. Now that Whitin Machine Works — big name in textile machinery — has adopted Angier's vapor method of rust prevention, parts are stored or shipped *clean* to *stay* clean . . . always ready for instant use. What a savings in "degreasing" time and equipment.

One box of the bottom rollers shown above required a full hour to "clean". With a monthly average of 400 boxes, customers have been spared 10 man-weeks in labor costs. Meanwhile, Whitin now packages these rollers in six minutes instead of fifteen — a monthly total of 40 hours instead of 100.

Used here as a box liner, Angier VPI* Wrap gives off a protective vapor that permeates the area around shiny parts . . . it robs moisture and air of all rust-making power. VPI is such a simple way to store or ship metal that you, too, will discover impressive savings. Send today for facts that apply to your industry.

Angier

The Most Experienced Name in Vapor Rust Preventives

*® *Vapor Rust Preventive* *Distributors in Principal Cities*

Angier Corp., Framingham 8, Mass.

Name.....

Title.....

(Clip this to your letterhead)

Please send "VPI Facts" as applied to:

- ☐ Machinery-Industrial, Metal Working, Farm, Office, Construction.
- ☐ Electrical Machinery, Appliances, Products.
- ☐ Transportion Equipment — Auto, Aircraft, Naval, Railroad, etc.
- ☐ Fabricated Products — Cutlery, Hardware, etc.
- ☐ Steel in process of fabrication.
- ☐ Ordnance Equipment.
- ☐ Instruments and clocks.
- ☐ Other.

Sinks Footer Costs

IF YOU'RE thinking about expanding your plant or building a new one, here's a tip that may cut down on construction time and expense.

A foundation borer made by Gar Wood Industries, Wayne, Mich., bores and bells the hole for foundation footers in one operation. The dirt is brought out in a bucket. Belling is done with expanding vanes.

As soon as the hole is drilled, cement is poured in. No backfilling necessary. It's already been used on the Chrysler jet engine plant at Detroit.

time, even during welding, operator releases the trigger.

Gun is rated at 250-amp and accommodates tungsten from 0.040 to 5/32-inch diameter. Maximum length is 7 inches. It can be used with either argon or helium.

Metallurgical Handbook Revised

Metallurgists faced with defense production problems may find some answers in a new edition of *Practical Metallurgy for Engineers,* issued by E. F. Houghton Co., Philadelphia. This fifth edition presents latest metalworking standards and practices, including, in addition, a discussion of probabilities for the future relating to new metals, alloying elements and types of heat treatment.

Chapters added since the 1943 edition include one on flame and induction heating. Following the chapter on carburizing, the 599-page revision contains new material on other surface hardening methods. Chapter on heat treatment of aluminum alloy is expanded to cover the broader field of nonferrous alloys. Other revisions incorporate latest American Iron & Steel Institute steel specifications.

Bekoma Drill Introduced

Four or six-spindle Bekoma turret drilling machine, made by Diedesheim, G.m.b.h., Germany, is introduced to the U. S. market by Cosa Corp., New York. Driven by one motor, spindles are mounted radially on a circular carrier that revolves around the center column.

Finding fuel for freedom

In field after field, the search for oil—life blood of America's industrial and military might—is spearheaded by OSTUCO Tubing in the form of core barrels, drill rods, shells, special couplings, and the like.

Engineers in the progressive oil business specify OSTUCO Tubing because they know it is made by tubing specialists with experience dating from the time seamless tubing was first produced in this country. They know they can count on OSTUCO for tubing of highest quality. Many other industries use OSTUCO Tubing—seamless or electric welded—because it enables them to increase strength, reduce weight, and cut cost of their products. We cannot always promise early delivery estimates on new civilian orders, because of military demands, but it will pay you to consult our experienced engineers about OSTUCO Tubing when redesigning your products to meet future competition.

From Your Blueprint . . . to Your Product
OSTUCO TUBING
Tapering • Swaging • Flanging • Bending
Upsetting • Expanding • Reducing • Beading
End closing • Spinning • Drilling • Slotting
Notching • Flattening • Shaping • Trimming
Threading • Angle Cutting • And Many Others

THE OHIO SEAMLESS TUBE COMPANY

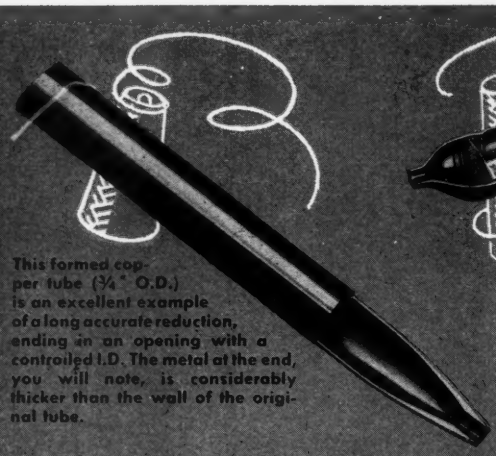
Manufacturers and Fabricators of Seamless and Electric Welded Steel Tubing

Plant and General Offices: SHELBY, OHIO

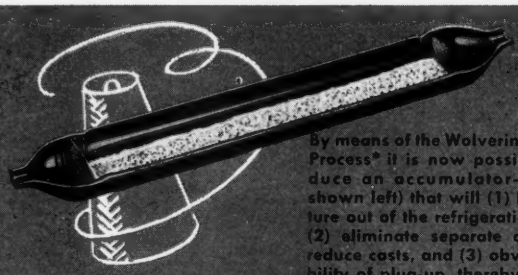
OSTUCO SHELBY, OHIO

SALES OFFICES: Birmingham, P. O. Box 2021 • Chicago, Civic Opera Bldg., 20 N. Wacker Dr. Cleveland, 1328 Citizens Bldg. • Dayton, 511 Salem Ave. • Detroit, 520 W. Eight Mile Road, Ferndale • Houston, 6833 Avenue W, Central Park • Los Angeles, Suite 300-170 So. Beverly Drive, Beverly Hills • Moline, 617 15th St. • New York, 70 East 45th St. • Philadelphia, 1613 Packard Bldg., 15th & Chestnut • Pittsburgh, 1206 Pinewood Drive • St. Louis, 1230 North Main St. • Seattle, 3104 Smith Tower • Syracuse, 501 Roberts Ave. • Tulsa, 733 Kennedy Bldg. • Wichita, 622 E. Third St. • *Canadian Representative:* Railway & Power Corp., Ltd.

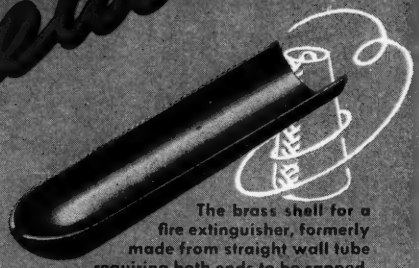
Spinning Realities



This formed copper tube (¾" O.D.) is an excellent example of a long accurate reduction, ending in an opening with a controlled I.D. The metal at the end, you will note, is considerably thicker than the wall of the original tube.



By means of the Wolverine Spun End Process* it is now possible to produce an accumulator-dryer (as shown left) that will (1) keep moisture out of the refrigeration system, (2) eliminate separate dryer, thus reduce costs, and (3) obviate possibility of plug-up, thereby removing any chance of pressure drop.



The brass shell for a fire extinguisher, formerly made from straight wall tube requiring both ends to be capped, is now made in one piece by having both ends spun. Leaks in joints are eliminated and more dependable units result. The new method achieves higher production at lower costs.

This part was formed from a tube in two operations: (1) end was formed to a semi-spherical shape by spinning, followed by (2) a combined process of coining the end flat and piercing the holes in a punch press.

Here is a good example of "long neck" type of reduction. A tube 1 1/16" O.D. has been reduced to 5/16" O.D. for a distance of 4¾". The beginning wall thickness is .022" and the reduced portion is .045". This one-piece construction eliminated many difficulties presented in former method of manufacture.

*A PATENTED PROCESS REG'D.

These are only a few of the hundreds of ways that the Wolverine Spun End Process has contributed immeasurably in increasing production output, saving on materials, reducing assembly costs, and with it all, attained more operating efficiency in the parts so produced.

WOLVERINE TUBE DIVISION
Calumet & Hecla Consolidated Copper Co.
INCORPORATED
Manufacturers of seamless, nonferrous tubing
1439 Central Ave., Detroit 9, Mich.

Wolverine Trufin and the Wolverine Spun End Process available in Canada through Unifin Tube Co., London, Ont.

PLANTS IN DETROIT, MICHIGAN AND DECATUR, ALABAMA
Sales Offices in Principal Cities

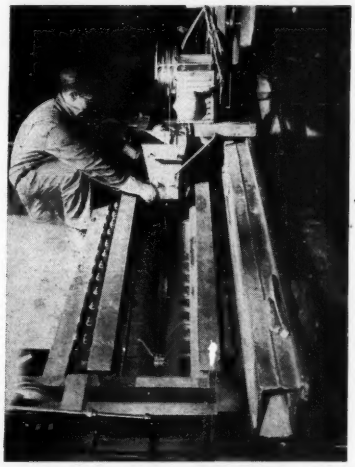
Twenty-four spindle speeds, from 28 to 1500 or 56 to 3000-rpm, can be obtained.

Turret design conserves floor space and permits one to four operators to work simultaneously. Machine can be equipped with multi-spindle heads or tapping attachments.

High Speed Plate Welding

Hidden arc setup for gondola chute plates gains speeds to 40 inches per minute

SPEEDS reaching 40 inches per minute are gained in hidden arc welding on ¼-inch flat plates through an automatic and mechanized setup. Plates can be handled to a maximum 6 feet wide



AUTOMATIC OPERATION
. . . no breakage from later working

with 100 per cent penetration of the weld bead.

Welded plates are used for forming gondola car chutes at Pullman Standard Car Co., Butler, Pa. Welding equipment is a product of Lincoln Electric Co., Cleveland.

Concentrates the Flux—Carriage spans a ball table on which two plates are positioned. It mounts a Lincoln hidden arc welding head with flux deposition and recovery unit. Trough serves to concentrate the flux along the weld line as head moves across carriage.

Below the joint is a copper backing strip. This is forced up against the plates by admitting air pressure to a length of hose underneath the backing strip. After completing a weld, the carriage moves down the track to a spot where two more plates are positioned. Completed piece is moved away to make room for the next setup.

No Breakage—When the chute subsequently is formed from the welded blank, it is bumped up to arch-like form, with the weld at the top of the arch. Later, this arch is pressed out so the plate is again flat at the weld.

Despite this severe working, no breakage at the weld was experienced. Power is supplied to the head through a 1200-amp dc generator.

Gage Covers Wide Range

Ability to cover an 8 million to 1 range on a single meter from a single pick-up is reported possible on a new DPI Phillips gage, type PHG-09. Development is announced by Distillation Products Industries Division, Eastman Kodak Co., Rochester, N. Y.

Division reports the gage can

From the viewpoint of many persons interested in manufacturing, there are many *new* developments taking place on the industrial front in New Jersey today.

Of particular interest is a *new* booklet about New Jersey. Entitled "An Industrialist's View of the Crossroads of the East", this brochure presents the *new* facts, the *new* figures and the *new* developments taking place now in industrial New Jersey.

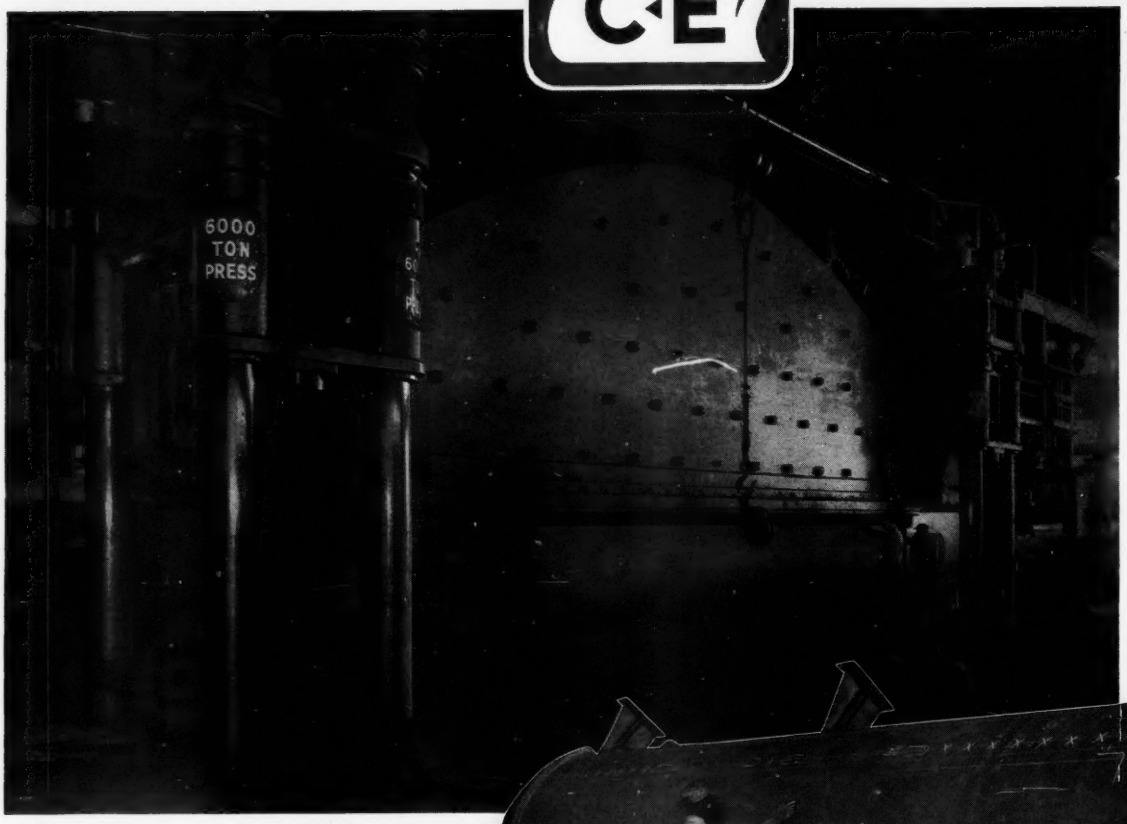
There's a lot of *news* at the Crossroads—*new* research plants, *new* steel mills, *new* highways, *new* markets, *new* opportunities for plant sites. If you want to know what's *new* in New Jersey, write today for your copy of "An Industrialist's View of the Crossroads of the East".

• •

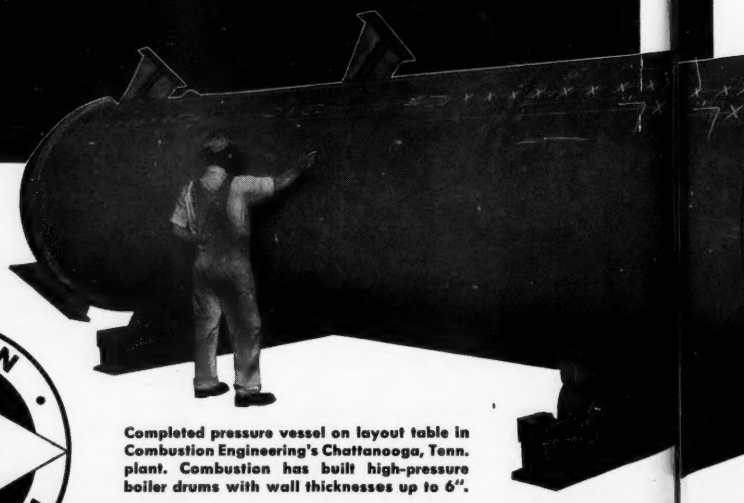
Write Box F, Public Service Electric and Gas Company, 76 Park Place, Newark, N. J. for the new brochure, "An Industrialist's View of the Crossroads of the East".

PUBLIC SERVICE

C-E cuts



The relentless 6000 ton pressure of this big Baldwin press easily bends 6-inch steel plates to the right curvature, while "joggling" feet on the press greatly simplify correct location under the ram.



Completed pressure vessel on layout table in Combustion Engineering's Chattanooga, Tenn. plant. Combustion has built high-pressure boiler drums with wall thicknesses up to 6".

BALDWIN
BLH
LIMA-HAMILTON

BALDWIN

production costs

with BALDWIN presses

Combustion Engineering-Superheater, Inc. is one of the world's largest manufacturers of steam generating equipment with some of its boilers as high as 15-story buildings.

Forming plates for these big boilers, many with 6-inch steel walls, takes plenty of machinery muscle —an important reason why Baldwin presses are such favorites at Combustion Engineering. The new 2000 ton press, for instance, has already broken production records for forming the "dished" heads. Its smooth application of power and finger-tip control has paid off in far easier and *far faster* production—in appreciable reduction of manufacturing costs.

This experience of C-E exactly parallels that of hundreds of other companies. Consistently they find that Baldwin presses give greater output, fewer rejects and lower operating costs. Adjustable ram stroke—full pressure capacity throughout the entire stroke—simple die set-ups—all combine to save time and cut costs.

If you are considering the purchase of a new press, be sure to write for Baldwin Bulletins 285 and 286.

BALDWIN-LIMA-HAMILTON CORPORATION
Philadelphia 42, Pa.
Offices in Principal Cities

Servomechanisms give finger-tip control of this 2000 ton Baldwin press and speed operations in forming of the "dished" heads for pressure vessels.

-LIMA-HAMILTON

LOW PRESSURE RELIEF VALVE

POSITIVE CONTROL

COMPACT DESIGN

NON-CORROSIVE

INFINITE ADJUSTMENT

HANDLE ANY GAS OR VAPOR

POSITIVE CONTROL AT 7-10 P.S.I.

Designed to operate within pre-set range of from 7 to 10 pounds per square inch, this new model C-13 relief valve provides positive control of any gas or vapor.

Recommended for use on rigid containers such as storage tanks, aircraft engine shipping enclosures and other containers requiring relief of excessive pressures.

Sturdy construction, compact design, non-corrosive parts and use of standard pipe thread fittings make this model C-13 relief valve readily adaptable to a wide range of applications.

Infinite adjustment within operating range is made possible by means of adjusting screw. Unit meets government salt spray tests.

Three models are available having ¼", ⅜" and ½" I.P.T. or special threads to meet individual requirements.

ANDAL is a manufacturer of low-pressure relief valves for prime contractors of defense items.

Write today for Data Sheet No. C-13

656-AA-V

ANDREWS-ALDERFER COMPANY

1127 Home Avenue • Akron 10, Ohio

Practical Protection

Special welding mask provides eye and respiratory protection against gases and metallic fumes during welding and burning. Used by Wyandotte Chemical Corp., it serves where mechanical exhaust ventilation is impractical, in nonexplosive areas. Mine Safety Appliances Co. developed the protector

be used to read vacuums from 0.50-mm to 0.0000001-mm Hg. The all-metal pick-up tube that handles this range works on the glow discharge principle. In the tube, permanent magnets provide a field that lengthens the electron paths into tight spirals. These give high ionization per electron, with a cascade effect.

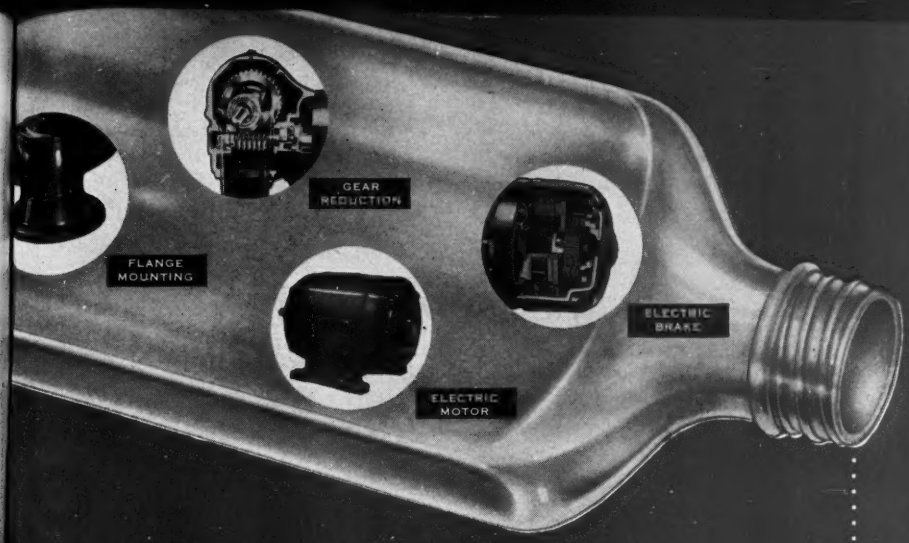
Because it has no filament to burn out, the new tube can be operated at full atmosphere without damage. In addition, the circuit is insensitive to fluctuations in line voltage.

Another advantage reported by the company is attributed to location of the magnets outside the ionization chamber. This prevents problems caused by outgassing the magnets or removing stray iron particles. Tube rids itself of deposited film when operated at higher pressures in the lowest sensitivity range.

Fewer Snowbound Yards

Tieups in winter months caused by snow in plant yards can be opened by using equipment from regular plant service.

One large trucking concern will equip a standard Yale & Towne 2000-pound capacity gasoline-pow-



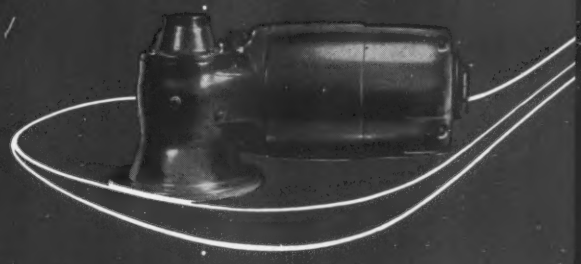
There's no one cure-all

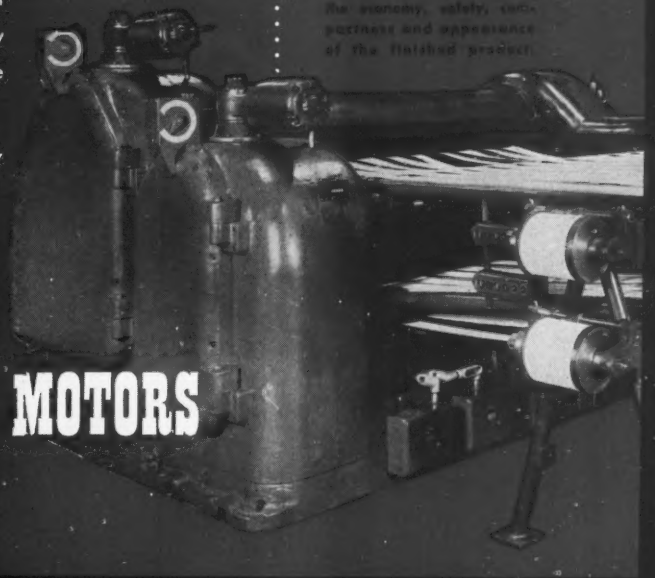
Each case is different. But you can select from Masters broad line the correct combination of features to give you the RIGHT horsepower, the RIGHT shaft speed, the RIGHT construction features, the RIGHT mounting . . . all combined into one compact power package.

Master Motors, available in thousands and thousands of types and ratings (⅛ to 200 HP) give you a breadth of selection you can get nowhere else. Master engineers can be completely impartial in helping you select the one best drive for you.

Use Master Motors to increase the salability of your motor-driven products . . . improve the economy and productivity of your plant equipment. They're the horsesense way to use horsepower.

THE MASTER ELECTRIC COMPANY
DAYTON 1, OHIO





MASTER ELECTRIC MOTORS

NOW-

Get the Newest Service in Fastener Supply!

Up-to-the-Minute

STOCK LIST

Continuous Inventory of

CAMCAR

AN NAS CT SCREWS
PHILLIPS HEAD SCREWS
INDENTED HEX HEAD SCREWS
SHEET METAL SCREWS
SEMS
STANDARD — SPECIAL
Steel, Brass, Stainless, Aluminum

FOR PROMPT SHIPMENT

Daily production of millions of units means that our stocks are continuously being replaced and expanded. If your urgent needs are not listed in this stock list, it may be that they are in process of manufacture. If not, they can be promptly manufactured for you to your specifications.

Write For Your Copy of This New Stock List
Request On Your Letterhead Will Bring Regular Mailing

Telephone 5-9451 or Teletype RK-8653

CAMCAR

SCREW & MFG. CORP.
603 EIGHTEENTH AVE., ROCKFORD, ILL.

"PRODUCTION-DESIGNED FOR YOUR ASSEMBLY LINE"

ered fork truck with a detachable snow plow and salt bin combination to do this job. Attachment clamps on the forks and can be installed or removed in a matter of minutes.

Mighty Mine Hoist

COPPER mine hoist drive being built by General Electric Co. at Schenectady, N. Y., for a block-caving mine operation in eastern Nevada is said to be the most powerful in the United States. Two 600-v, dc motors, with a combined rating of 3300 hp at 500 rpm, comprise the drive that will power a hoist operating in a shaft 1700 feet deep.

Fast Delivery—Hoist itself, being built by the Nordberg Mfg. Co.

Sounding Out Dirt

ULTRASONICS is being pulled out of its laboratory cocoon and put to work for industry.

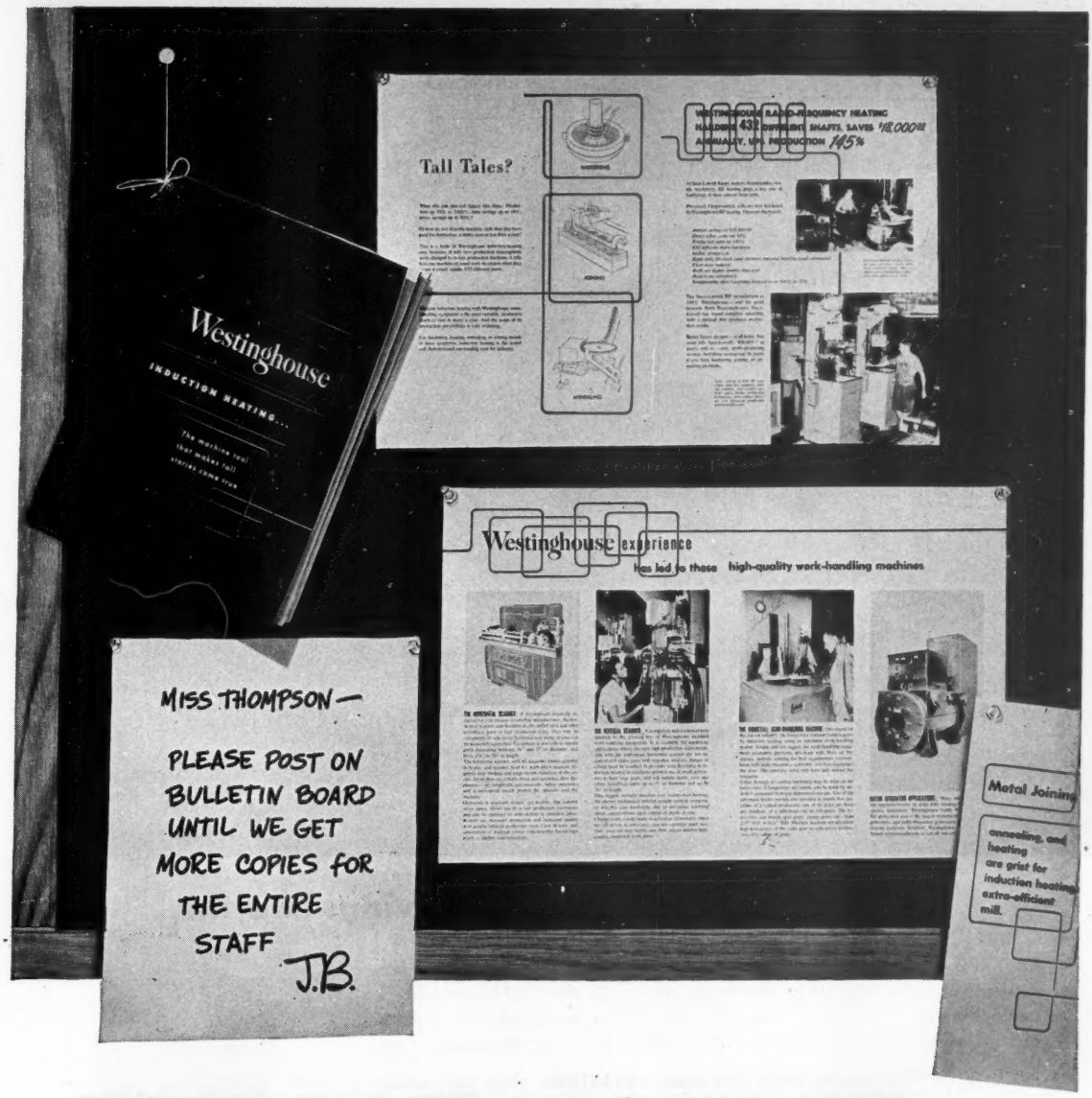
Spectacular usage is in the super-cleaning of small parts. By beaming a sound wave, usually in the 300 to 1000 kilocycle per second range, through the cleaning solvent or detergent to the p'ece being cleaned, an unbelievably thorough cleansing is accomplished.

will have two skips arranged in balance and weighing 21,000 pounds each. When operating from maximum depth, it will be capable of delivering 12 tons of copper ore to the surface every 72 seconds.

Besides the ore hoist drive, GE is building a 600-hp drive for a Nordberg man and materials hoist. This drive will be powerful enough to raise a double-decked cage at a rate of 1200 fpm.

Operations Smooth — Both ore and man hoists are equipped with amplidyne-type controls, providing smooth and rapid acceleration and deceleration.

Powering the hoist motors will be two 1250-kw generators driven by a synchronous motor. Other equipment for the installation includes a 20,000-kw turbine, pump and compressor motors, ball mill drives, and other auxiliary apparatus.


Westinghouse
INDUCTION HEATING...
Tall Tales?
Westinghouse experience
has led to these high-quality work-handling machines
MISS THOMPSON—
PLEASE POST ON BULLETIN BOARD UNTIL WE GET MORE COPIES FOR THE ENTIRE STAFF
J.B.
Metal Joining
annealing, and heating are grist for induction heating's extra-efficient mill.

HERE'S PROOF OF INDUCTION HEATING'S AMAZING RECORD—

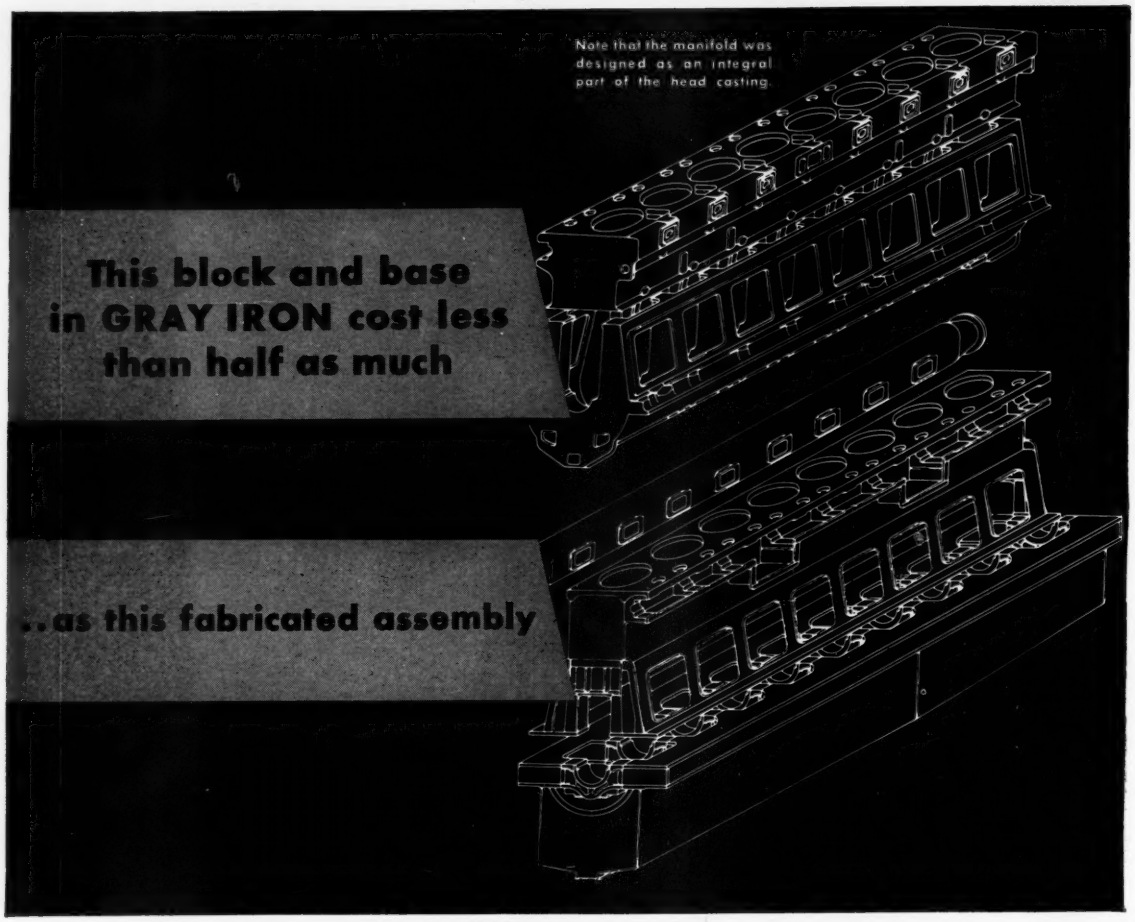
Actual case histories of hardening, brazing, soldering, and annealing installations show how the RF process has meant increased production (as high as 2000%), lower costs (as much as 90%), and a higher quality product for many of America's leading manufacturers. It's an amazing story — with facts and figures released by the companies themselves — and results that speak for themselves. See how these manufacturers' experiences may parallel your own . . . how RF Heating may help achieve production efficiency in *your* plant.

Send for this free booklet today — ask for B-4782. Write Westinghouse Electric Corporation, Department S-35, 2519 Wilkens Avenue, Baltimore 3, Maryland.

YOU CAN BE SURE...IF IT'S Westinghouse

INDUCTION HEATING

J-02235


Note that the manifold was designed as an integral part of the head casting.
This block and base in GRAY IRON cost less than half as much
..as this fabricated assembly

You can't afford to pass up savings like this!

GRAY IRON CASTINGS COST LESS than fabricated assemblies in over 90 per cent of the cases studied by the manufacturer of this well-known diesel engine (name on request). Shop records of this manufacturer indicate that average savings of 50% can be obtained by using castings.

BETTER STILL—GRAY IRON GIVES YOU MORE ADVANTAGES than any other single production material or method of production: Castability, Rigidity, Low Notch Sensitivity, Wear, Heat and Corrosion Resistance . . . Durability . . . Vibration Damping . . . Machinability, Wide Strength Range.

CONSIDER GRAY IRON FIRST for maximum flexibility of design at minimum cost. Progressive design engineers do—that's why the gray iron foundry industry is the second largest in the metal-working field.

Make it Better with Gray Iron

Second largest industry in the metal-working field

SCRAP IS NEEDED FOR DEFENSE—KEEP IT MOVING!

GRAY IRON FOUNDERS' SOCIETY, INC.

NATIONAL CITY-E. 6th BLDG., CLEVELAND 14, OHIO

Room Without Echoes

Tests in an anechoic chamber may show ways to solve many distressing noise problems

POINT OF NO RETURN for echoes is built into a new sound laboratory by Westinghouse Electric Corp. More precisely called an anechoic chamber, the room will permit research engineers to study noise—its source, cause and measurement.

Dr. Patric Conley, acoustical research manager at the company's research laboratories, says noise elimination or reduction in present equipment lines costs about $500,000 a year for each decibel of sound diminution.

Wedge-Shaped Insulation—Laboratory is located in a suburban area of Pittsburgh to gain advantage of a comparatively low surrounding noise level. Inside the main building and surrounded by masonry walls 12 inches thick, is a 19 x 13 x 10-foot room with walls, roof and floor covered completely by wedge shaped insulating material.

These wedges are the key to anechoic chamber. It is their shape, composition, size and number that determines the room's efficiency.

Fabricated from glass wool, each wedge is 8 x 24 at its base, 31 inches long. Wire mesh with ½-inch openings encases each wedge to facilitate installation and protect the fragile filler.

Causes Come First—Spring-supported wire is stretched from all four side walls, several feet above the chamber's wedge-covered floor. Service lines are available overhead to operate the various test pieces. Control panels in an adjoining room carry all gages and recording devices, because the chamber must be emptied of everything but the noise source and a microphone and pickup during test runs.

Dr. Conley emphasizes that the sound study program will not be a rapid research with solutions to present problems the immediate goal. "We must first," he says, "understand thoroughly the detailed causes of various sounds, their means of propagation and

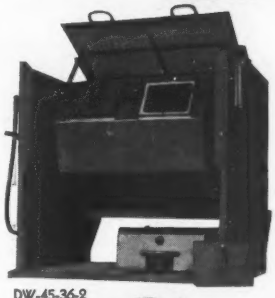
ROTO FINISH
Trademark Reg. U. S. Pat. Office

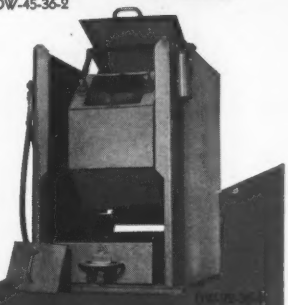
NOW!

put your precision finishing on a mass production basis

SAVE MANHOURS AND MONEY . . . the original Roto-Finish processes completely eliminate hand finishing in most instances. GET ABSOLUTE UNIFORMITY . . . in any quantity. MAINTAIN exact tolerance on precision parts. CUT FINISHING costs as much as 80% . . . this fact has been proved many times in actual installations. LOWER INITIAL AND MAINTENANCE costs . . . you need only one Roto-Finish machine to replace several manual grinding or polishing machines. No exhaust system is ever required.

DW-60-36-2


DW-45-36-2



ROTO-FINISH COST-FREE ENGINEERING SERVICE GUARANTEES RESULTS!

Send a few unfinished parts to us . . . plus a finished part for a guide, (or we'll be glad to pick them up from your plant) for a "no charge" demonstration. Then sit back and let us *prove* that Roto-Finish will finish your parts . . . to your specifications . . . and save you time and money. We *guarantee* that you can get the same results in your plant that we produce in our laboratory. *There is no obligation for this service.*

Write for fact-packed Roto-Finish Catalog for complete information.

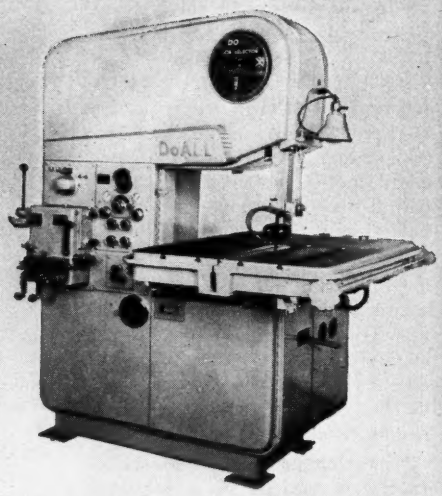
VISIT BOOTHS 3 and 4, Aisle F
INDUSTRIAL FINISH EXPOSITION
Chicago, June 16th thru 20th

Roto-Finish COMPANY
Associated with The Sturgis Products Co.
P.O. Box 988

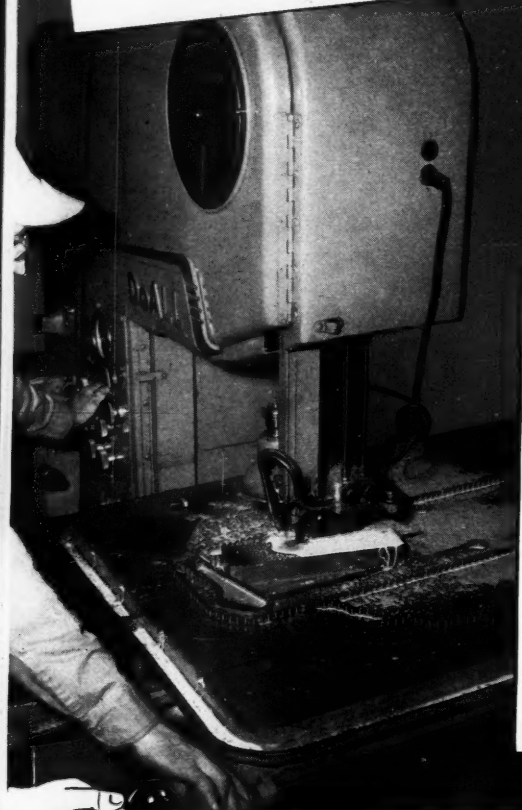
FOREIGN REPRESENTATIVES: CANADA — Windsor — Roto-Finish Canada Limited • ENGLAND — London — Roto-Finish Limited — 39 Park Street — Mayfair • AUSTRALIA — Melbourne — A. Flavell Pty, Ltd. • HOLLAND — Delft — N. V. Roto-Finish Maatschappij — Rotterdamse — WEG 370A • AUSTRIA, GERMANY, SWITZERLAND — Frankfurt a.M. — Metallgesellschaft A.G., Germany • ITALY — Milan — Societa Roto-Finish a R.L. — Sesto S. Giovanni — Viale E. Marelli 31 • FRANCE — Paris — Societe Roto-Finish, 70 rue de la Republique-Puteaux (Seine) • BRAZIL — Rio de Janeiro — Commercial E. Industrial de Formos Werco, Ltds.

YOU CAN BENEFIT FROM

Use the DoALL method for fast low cost machining. Shape and save all types of material. Release larger expensive tools for more profitable operations.



DoALL CONTOUR-MATIC—Finest, most useful band machine built. Variable tool speed 40 to 10,000 feet per minute. Saws, files, polishes, grinds, hones, slices all materials. Hydraulic operation with finger tip controls delivers increased production at lower cost.



DoALL'S PAY PRICED AS LOW

BAND TOOLS FOR EVERY PURPOSE

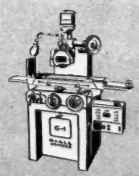
—precision, buttress, claw tooth, spring temper and friction saw bands; line grind, diamond and file bands; scallop edge, spiral edge and knife edge bands; abrasive bands. Ask for catalog.

WHATEVER your band machining requirements, you can find the right model in the DoALL line. There are standard machines to meet almost every conceivable requirement: seven frame sizes; five throat sizes; speeds from 40 to 15000 f.p.m.

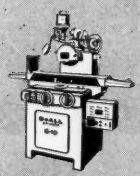
There is a fixed speed, 16" throat *Utility* bandsawing machine for only $350. There is a combination bandsawing, filing and polishing *Utility* model having a dual variable speed range and attached saw blade welder for only $750—*the biggest bargain available anywhere in a band tooled machine.*

There are the big, high speed DoALL *Zephyr* machines, to handle work loads weighing a ton or more and with Hydro-Feed tables for fast, labor-saving production.

The DoALL *Contour-matic* is unmatched in operational scope, quality of work and productivity.

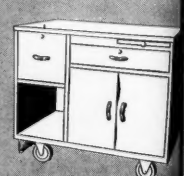


PRECISION SURFACE GRINDERS



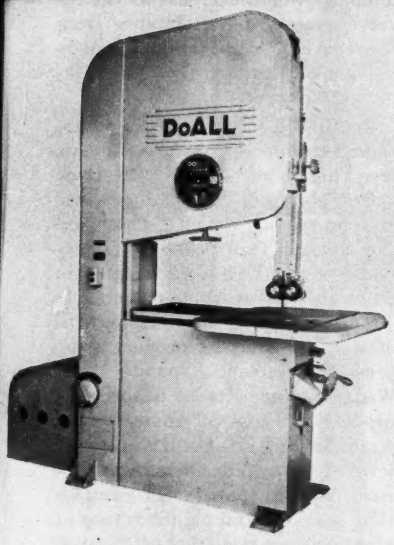
GAGE BLOCKS

GAGING EQUIPMENT

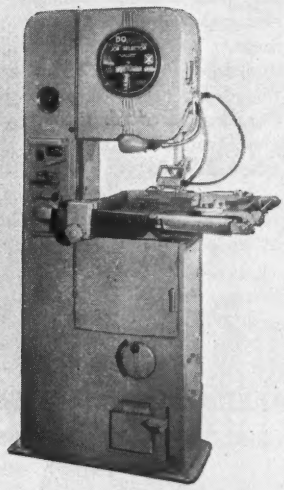


MOBILE INSPECTION

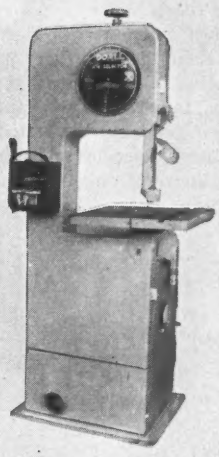
DoALL BAND MACHINING!



DoALL "ZEPHYR" MACHINES—For safe high speed sawing, up to 15,000 feet per minute. Widely used for Friction Sawing. Single or variable speed models—16″ to 60″ throat capacity. Pedal operated or automatic brakes optional on high speed machines.



DoALL CONTOUR MACHINES—For precision bandsawing, filing and polishing in every type of metal working shop. Effortless and precise control of speed and feed result in exceptionally efficient operation and reduced tool cost. Available in 16″, 26″, 36″ or 60″ throat capacity with work height under guides as required.



DoALL "UTILITY" MODELS—Light duty low cost bandsawing machines. Fixed speed for plastic or woodworking—variable speeds for more effective and economical metal sawing, filing or polishing. A dual range model combining both high and low speed control is a natural for experimental work on different materials.

IN ANY SHOP . . . AS $350

DoALL *Contour* machines are work horses of the metal shop, handling hundreds of conventional cutting jobs with accuracy and speed.

And, there are special production machines built to order for high output on your special applications.

No matter what your job, there is a DoALL Band Machine to handle it. Call your local DoALL Sales-Service Store or write:

The DoALL Company
254 N. Laurel Ave., Des Plaines, Ill.

"Band Machine Headquarters"

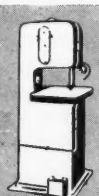
ASK FOR CATALOGS

DoALL

DoALL Mobile demonstration units will bring a DoALL Band Machine right to your plant and demonstrate it on your work. There is no cost or obligation. Simply "Call DoALL" locally, or write to DoALL at Des Plaines, Ill.

B-15

SAW BLADE WELDERS



BAND FILERS

BENCH FILERS

TOOL GRINDERS

TOOLMAKER'S LATHES

TOOL STEEL

radiation, and their psychoacoustic effects—the effects on the human ear of sound level and frequency. With these problems solved, various apparatus noises can be reduced or completely eliminated more easily.

First Project — Determining a standard method for measuring noise is one of the first projects to be tackled by the new laboratory. National Electrical Manufacturers Association specifies certain limits of sound emanation for each type of electrical equipment. But, noise-measuring methods throughout the industry vary widely.

Plans for other investigations may lead to sound reduction in several types of the company's equipment. These include ballasts in fluorescent lighting fixtures, transformers, refrigerators, vacuum cleaners, air conditioning units, home radio speakers and jet engine test cells.

Physical Factors — In a free sound field, such as would exist at an altitude of 50 or 100 miles, sound waves would emanate from a source in all directions. Their intensity would decrease as the inverse square of the distance from the source. This would preclude the presence of any kind of background noise.

Because there would be no surrounding walls or obstacles in this free field, no sound reflections would occur, or complete absence of echo would prevail. These are the physical factors that Westinghouse engineers have attempted to build into the anechoic chamber.

The lab's quiet site and its type of wall construction produce a depressed ambient sound level. Wedge design acts to absorb and prevent reflection of sound waves. According to Dr. Conley, a sound level of 10 to 15 decibels within the room is anticipated. In comparison, a residential neighborhood at night has a noise level of 25 to 30 decibels.

Good for many years at hard labor
YORK·GILLESPIE
CUSTOM-BUILT MACHINERY
for
Steel Mills • Steel Fabricators
Industrial Manufacturers
Now is the time to modernize your industrial machinery. For never before has American industry encountered such a challenge! Its double job of producing for defense and civilian needs demands plant machinery built stronger, to last longer.
York-Gillespie Manufacturing Company — designers and custom-builders of special machinery — and York Engineering and Construction Company form an unbeatable team working to develop and build machinery to fit your production requirements.
From Your Own Blueprint or Our Design
Special machinery is created in our shops from your own design . . . or we will design and fabricate to solve your specific problem.
Send York-Gillespie your machinery specifications. Your inquiries will receive prompt attention.
YORK-GILLESPIE MANUFACTURING CO.
and
YORK ENGINEERING & CONSTRUCTION CO.
951 Penn Avenue, Pittsburgh 22, Pa.

Lathe "Pack" Cuts Costs

PACKAGING and shipping of a heavy lathe was the problem. But after an Ohio and Missouri company got together, a new "package" for protecting and shipping a 3600-pound engine lathe materialized.

The new packaging technique developed by Cincinnati Metalcrafts Inc., and Gaylord Container Corp. of St. Louis, saves 50 to 75 per cent in costs and 55 per cent in the weight of the package.

Formerly the Cincinnati firm prepared the 3600-pound engine lathe for shipment by covering it with a large paper bag to keep out dirt and then housing it in a nailed wooden crate.

Container Is Solid — The new method is to build a solid fiber container that completely encloses the lathe. This is done by capitalizing on the wooden skid on which the lathe rests.

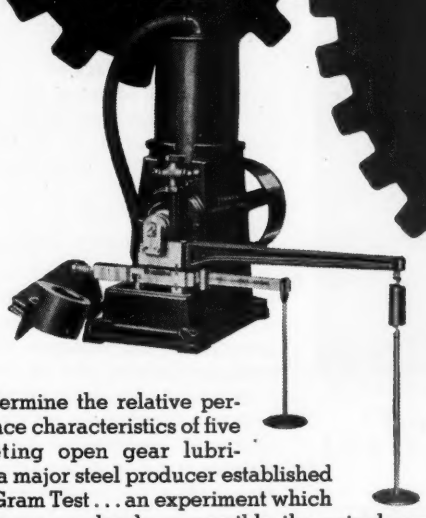
A simple vertical wooden frame bridging the center of the lathe is constructed and a stapling hammer used to attach six pieces of solid fiber to the skid and vertical wooden frame. The final step is to staple and tack a lid to the top portion of the fiber container and vertical wood frame.

The result is a streamlined, dust resisting "package" peaked in the

INDEPENDENTLY CONDUCTED

4-GRAM TEST

—PROVES LEADOLENE KLINGFAST BEST FOR LUBRICATING OPEN GEARS



To determine the relative performance characteristics of five competing open gear lubricants, a major steel producer established the 4-Gram Test . . . an experiment which reproduces as closely as possible the actual service conditions encountered in open gear and sleeve bearing lubrication.

In this test the Timken Testing Machine, recognized as standard equipment for testing lubricants, was modified slightly to reproduce more precisely actual service conditions. The hardened and ground steel block and cup, indicated at right, normally is under constant lubrication. However, in the 4-Gram Test the flow of lubrication was cut off and 4 grams of the lubricant being tested were applied at room temperature. The machine then was set in motion and watched closely for signs of scoring.

Five lubricants, all accepted in industry as "good quality," were tested. *Results of the test showed that LEADOLENE KLINGFAST gave over 3½ times the service of the next best lubricant and up to 6 times the service of the other lubricants tested.*

Since open gears are lubricated periodically and not constantly, the pH-ilm must have lasting characteristics. Thus, this test is truly representative of actual field operation tests for open gears. The enduring action together with extremely high pH-ilm strength guarantee the machine actual lubrication and protection.

In testing . . . and more important, in actual service . . . LEADOLENE KLINGFAST regularly gives comparable performances. A product of 76 years of manufacturing experience, it is a lead-based lubricant with an "Indestructible pH-ilm," capable of withstanding pressures up to 50,000 psi. With LEADOLENE KLINGFAST you profit in two ways: from lowered lubrication costs due to less frequent application, and from greater service life from the machinery being lubricated.

Write for technical data or samples for your own testing.

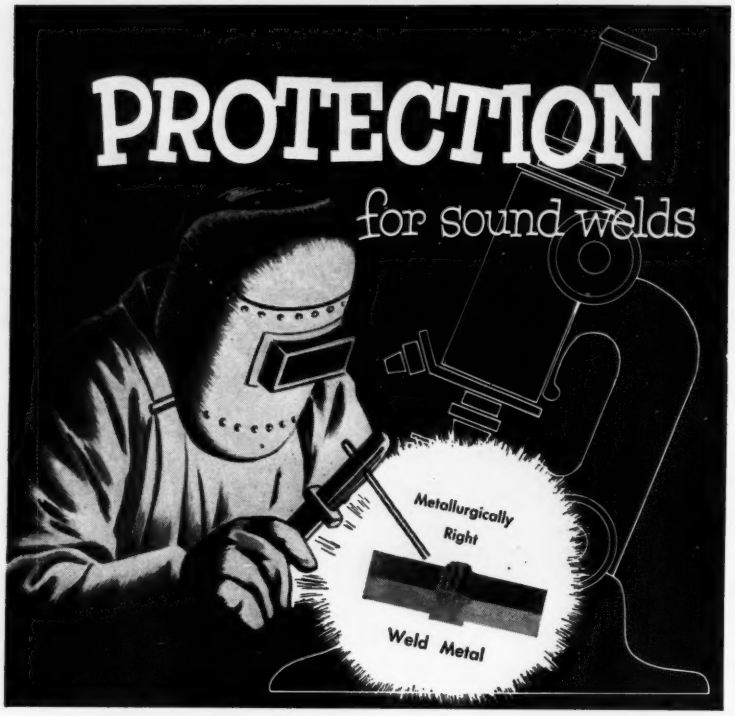
THE BROOKS OIL CO.

Since 1876

Executive Offices and Plant.....CLEVELAND, OHIO
Executive Sales Offices.....PITTSBURGH, PA.
Canadian Offices and Plant.....HAMILTON, ONTARIO
Cuban Office.....SANTIAGO de CUBA

Results OF 4-GRAM TEST

LEADOLENE KLINGFAST	LUBRICANT "A"	LUBRICANT "B"	LUBRICANT "C"	LUBRICANT "D"
30 MINUTES	5 MINUTES	8 MINUTES	6 MINUTES	6 MINUTES
without scoring or failing.	A high grade compound scored at 5 minutes and failed in 12 minutes.	A reputable lubricant of residual nature scored and failed in 8 minutes.	A good lead compounded extreme pressure lubricant scored and failed in 6 minutes.	A lead-compounded lubricant scored and failed in 6 minutes.



Use ARCOS "Quality Controlled" Stainless Electrodes

In the split-second flash of an arc, Arcos stainless electrodes produce the "right" weld metal for the job at hand. This is the result of Arcos' experience with fabricators' welding problems . . . competent research in the behavior of various grades of electrodes in use and weld metal in service . . . a strict application of quality control in manufacture.

The value of any electrode lies in the quality of the weld metal it produces. And that's where Arcos strives to build the values that count . . . soundness, specific mechanical or corrosion resistant properties, or microstructures that can stand-up to destructive service conditions. ARCOS CORPORATION, 1500 South 50th St., Philadelphia 43, Penna.

WELD WITH ARCOS

Specialists in Stainless, Low Hydrogen and Non-Ferrous Electrodes

center to shed showers that might fall during transportation. The principle is adaptable to machine tools of varying sizes.

The package can be assembled by two men in 30 minutes instead of four hours, and has had excellent reception among railroads and truck lines.

System May Lower Costs

Series of preferred numbers recommended by ISO restricts product variety

TWO recommendations concerning international adoption of series of preferred numbers were unanimously approved by a technical committee of the International Organization for Standardization at a meeting held June 9 and 10, at Columbia University, New York.

Skillful application of the numbers by the designer or standardizer will restrict variety in a line of products to the minimum that will meet demands of the user with a view to function or appearance or both. At the same time, the manufacturer benefits by lower production costs. Delegates from the standards organizations of 12 nations participated in the work of the committee.

What They Are—Preferred numbers are series of numbers, each series having a constant step-up in percentage from one number to the next.

For example, in the so-called "five" series, the preferred numbers covering the range from 10 to 100 are: 10, 16, 25, 40, 63 and 100, which represent a step-up of about 60 per cent. Other series have smaller percentage increases hence, a finer step-up from one number to the next.

The intention is that designers, in laying out a line of products whose essential characteristic (such as length, cubic content or power rating) is required to increase throughout a given range, will choose preferred numbers for the numerical values of that characteristic, unless there is a good reason for deviating from these numbers.

How Used—One of the two documents approved by the ISO committee is entitled, "Series of Preferred Numbers," and gives four

basic series to be used in a given order of priority.

The designer can begin by trying the five-series, providing a 60 per cent step-up is satisfactory for his purpose. If this grading is too coarse, the designer can take the 10-series, where the increase between consecutive numbers is 25 per cent.

If a still finer gradation is necessary, there are the 20 and 40 series, with step-ups of 12 and 6 per cent, respectively. An additional 80-series, to be used only in exceptional cases, gives a 3 per cent step-up.

ASA Ahead — An American standard, recommending the use of the five series just mentioned, was published by the American Standards Association in 1936.

The second ISO document just approved is a guide to the use of series of preferred numbers. It lays down the general principles of applying preferred numbers for various purposes, such as the establishment of a series of capacity ratings for a line of motors, or a series of thickness of metal sheets.

Guide Discussed—The ISO committee also discussed a first draft proposal of a guide for the application of preferred numbers to nominal linear dimensions used in mechanical and other industries. It was decided that a new draft, revised in accordance with the discussions, should be prepared.

The meeting of the ISO committee on preferred numbers was held in connection with the 1952 triennial conference of the ISO in which the American Standards Association is acting as host to the foreign member bodies of ISO.

Chairman of the New York meeting was P. F. R. Blanchet, an industrial executive from Paris. Head of the American delegation was Harold P. Westman, International Telephone & Telegraph Co., New York. France holds the secretariat for the committee.

Clad-Steel Pipe Supports

Leg trouble no longer should be the problem for those maintaining lead heating and cooling coils, such as those used in the processing of corrosive acids.

Knapp Mills Inc., New York, developed a support of lead-clad steel. This support is strong, not affect-

Use ARCOS Low Hydrogen Electrodes

ARCOS GRADE	A.W.S. SPEC.
Tensilend 70	E7016
Tensilend 100	E10016
Tensilend 120	E12015
Manganend 1M	E9016
Manganend 2M	E10016
Nickend 2	E8015
Chromend 1M	E8015
Chromend 2M	E9015

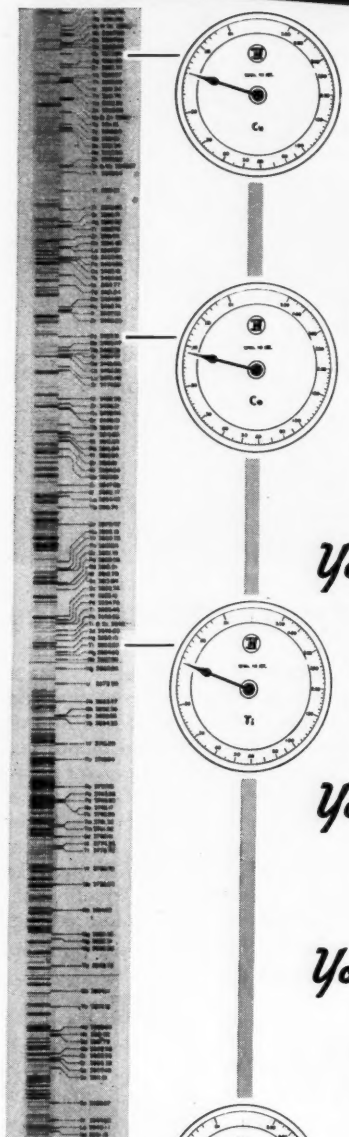
When you can deposit sound weld metal without changing electrodes to meet different welding positions—and use the same electrode on A-C or D-C current—you're saving time and inconvenience. With few exceptions, all types of Arcos Low Hydrogen Electrodes offer this advantage on a variety of base metals. That means a smaller inventory, since you can safely weld many jobs from start to finish with ONE ELECTRODE. Because Arcos Low Hydrogen Electrodes are "quality controlled," there's no danger of underbead cracking.
ARCOS CORPORATION · 1500 South 50th St., Philadelphia 43, Penna.

WELD WITH

ARCOS

Specialists in Stainless, Low Hydrogen and Non-Ferrous Electrodes

APPLICATION OF *Arithmetic*



with

Baird Associates

DIRECT READING SPECTROMETER

For Application to Problems of Furnace Control Analysis

Here's How:

If your present method of analyzing a heat takes 20 minutes

And B. A. Direct Reading Analysis takes 5 minutes

20 minutes
— 5 minutes

You Save . . 15 minutes per heat

And if your furnace time is worth $1.50 a minute (which is a low figure), then

$1.50
x 15
750
150

You Save . . . $22.50 per heat

Suppose you run 10,000 heats per year. Then

$22.50
·x 10,000

You Save $225,000 in one year with **DIRECT READING SPECTROMETRY**

Take it any way you want. If you're not saving this much then you're losing that much, which is too bad.

READ, FREE OF CHARGE Bulletin No. 34 and

BETTER ANALYSIS . . . the present issue of which tells about emission spectroscopy.

Baird Associates, Inc.

33 UNIVERSITY ROAD CAMBRIDGE 38, MASS.

ed by acids and will not deform under temperature changes.

In easy-to-assemble units the supports can be adapted to different pipe and coil sizes.

Portable Air Movers

Small flexible ventilators are effective in clearing air near welding operations

FUMES AND SPARKS from welding operations can be cleared by portable air movers—and the job can be done just as effectively as with a permanent ventilating system.

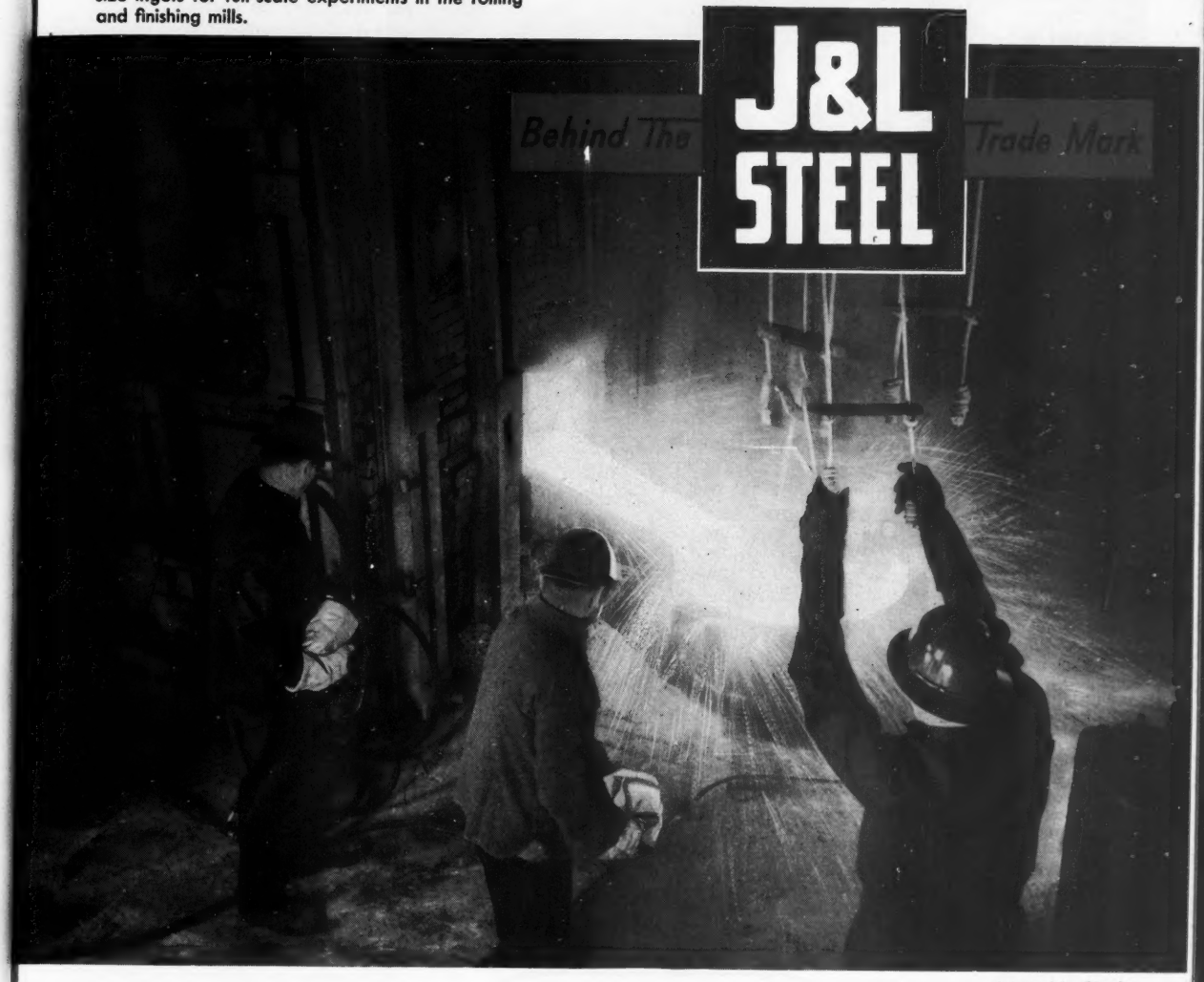
This is the report made by Eddystone Division, Baldwin-Lima-Hamilton Corp., where about 100 of these small compressed air units are operated. Mine Safety Appliances Co., Pittsburgh, the manufacturer, says its product is about 3 feet long, but weighs only 5 pounds.

COMPRESSED AIR VENTILATION
. . . bases cleaning on venturi effect

Flexible Spotting—Extreme portability permits welders to move air cleaners close enough to the actual operation to remove practically all sparks and fumes, discharging impurities into the building's upper reaches. This flexibility also gives the workmen opportunity to station the unit either outside or inside large weldments.

Baldwin reports other features result from portability and uncomplicated construction. These include the relatively small investment involved and the fact that no time was required for an extensive

The pilot open hearth furnace, pioneered by J&L, is an important unit of research equipment. This four-ton capacity furnace, under complete laboratory control, is capable of producing production size ingots for full-scale experiments in the rolling and finishing mills.



photograph by d'Arazien

The "watch" over quality is never-ending . . .

THE term "steel quality" has almost as many meanings as there are uses for steel. No steel is equally well suited for all purposes. There are degrees of strength, corrosion resistance, machinability, resistance to abrasion, and many other properties of steel. Steelmaking and finishing processes must be under strict metallurgical control if the required quality is to be duplicated in successive lots of steel.

The most important factor in the control of steel quality is the need of the steel user. The steel is made to specifications that are designed to fit his individual requirements.

Quality control is a continuous function at J&L. Beginning with raw materials, the "watch" over quality is maintained through every step of production and finishing operations. The efforts of skilled workmen, applied to the most modern production equipment, are coordinated with technological information developed and interpreted by J&L research personnel.

The J&L trademark is recognized as a symbol of consistent and dependable quality to steel users in all branches of American industry.

JONES & LAUGHLIN STEEL CORPORATION
PITTSBURGH 30, PA.

plant duct work installation. The latter factor was essential, while setting up plant facilities last year for Army tank hull production.

Venturi Effect — Operation is based on venturi effect produced when compressed air or steam is expanded at high velocity through an annular orifice and outlet horn. Smaller models remove about 4 cfm of air from the weld zone.

Another important advantage, says Baldwin, is the absence of maintenance requirements. Air movers have no moving parts, motors or fans. This, in turn, serves to minimize explosion hazards in handling dust, gas-laden or heated atmospheres.

Data on Dry Lubricants Given

"Cyanamid Zinc Stearate U.S.P. As a Lubricant in Powder Metallurgy", a technical data sheet published by the Specialty Products Department, is now available upon request, American Cyanamid Co., New York, reports.

In the fabrication of oilless bearings, magnets and machine parts from powdered metal, it is common practice to add from 1 to 3 per cent zinc or calcium stearate as a dry lubricant.

Addition of metallic stearates improves the flowability of the powder into molds, and increases the density of the finished product by permitting closer packing of the powder under pressure.

Weld Saves Dollars

SAVINGS of $1000 on $1300 would be called substantial by even the most conservative. Here's how one company did exactly that.

Processors of flax, their dryers are equipped with cast iron heads, into which steam tubes are screwed to provide a rotating series of hot pipes. These pipes remove moisture in flax before the linseed oil is extracted.

Seal Is Broken—Failure occurred in a packing gland journal which keeps steam from leaking around the joint as the head revolves at about 100 rpm. Ordinarily, replacement of these glands cost $1300.

This time they called in Alloy Hardfacing Co., Minneapolis, and the job was done over a weekend. Cost—$300.

Here's what they did:

Fastened the journal to a rotating positioner and preheated evenly to 500° F. They then gas welded using a nickel-silver rod. The part was slowly cooled to room temperature and machined to size.

After five months service the job shows no sign of weakening.

Bearing Torque Tested

Torque transmitted through small instrument ball-bearings can be measured under thrust loads with a tester made by General Electric Co., Schenectady, N. Y.

Designed to act as a quality control check in both production-line and laboratory work, the new tester is able to show how the torque of a small ball bearing varies as a function of angular position during a continuous slow rotation in either direction.

Equipment determines bearing torque by measuring the current drawn by a torque motor in counterbalancing the bearing race

PAINT OVER RUST
with
TYGORUST

That's right!! You can paint right over rust with the new and different primer — TYGORUST — and, get excellent adhesion! Specifically developed for use under vinyl based coatings, TYGORUST virtually eliminates surface preparation — dries hard in minutes — covers up to 500-600 sq. ft./gallon — and, is rust inhibitive. What's more, its use is not limited to vinyls — it goes under any type of finish and provides excellent adhesion for all.

TYGORUST successfully primes iron and steel — clean or rusted — wet or dry. It can also be used on wood, concrete and previously painted surfaces (bituminous coatings excepted). It brushes easily — sprays beautifully. It can be over coated in as little as ten minutes.

Write for details, today — try TYGORUST, tomorrow! Give it the toughest tests — actually see how well it works!

PAINT OVER TYGORUST WITH TYGON PAINT

For maximum resistance to corrosive fumes and spillage, use the perfect running mate for TYGORUST — TYGON "Series TP" PAINT. TYGORUST was created for use with TYGON PAINT. TYGON PAINT was created — more than ten years ago — to provide outstanding protection against acids, alkalies, oils, greases, and water. TYGON PAINT is quickly applied — dries fast — forms a tough, smooth, flexible film that's long lasting, easy to clean, and non-flammable when dry.

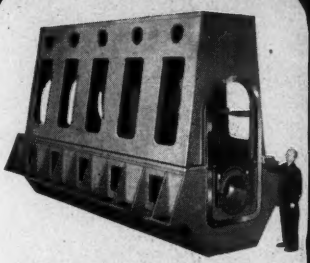
Use the best defense against chemical corrosion. Use TYGORUST plus TYGON "Series TP" PAINT. Write, right now, for full details and resistance data — ask for Bulletin 720.

PLASTICS AND SYNTHETICS DIVISION

U. S. STONEWARE
akron 9, ohio

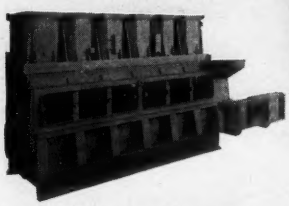
345C

Steel-Weld FABRICATION



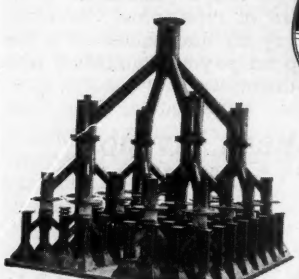
Crank Cases, Frames, and other Parts for Manufacturers of Marine Steam Engines of Uniflow or Multiple Expansion Type.

Heavy Press and Machine Frames and Bases for the Machine Tool Industry.

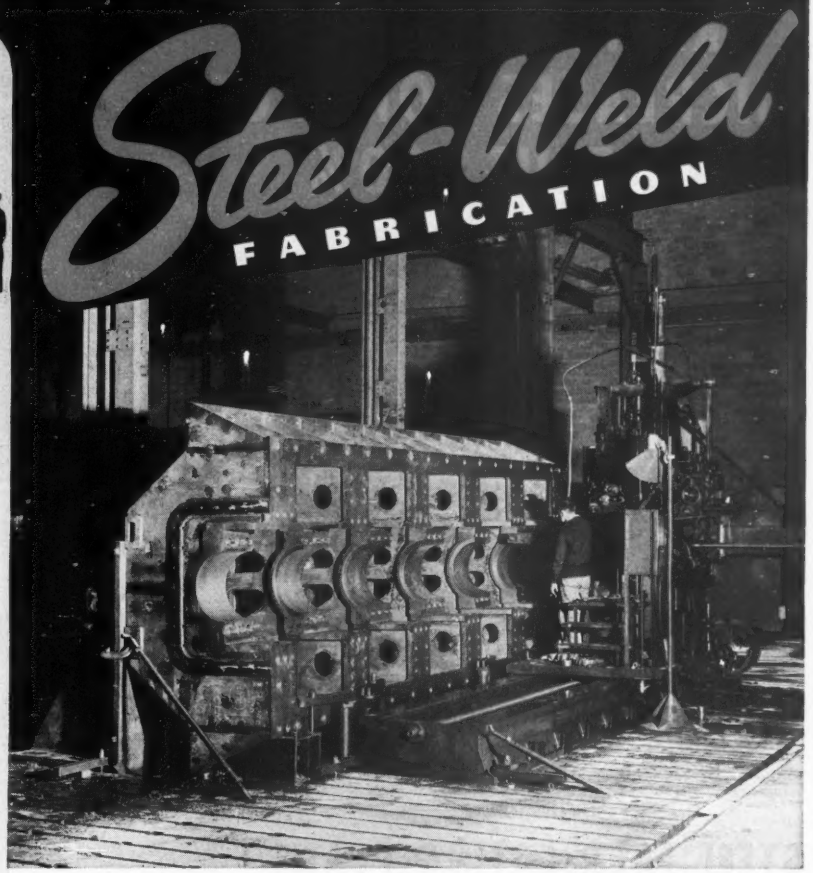


Diesel Engine Crank Cases and Frames for the Marine and Electro-Motive Field.

Pressure Vessels for the Chemical and Allied Industries.



One of Several Parts of a Catalytic Cracking Plant Produced for the Petroleum Industry.



Use WELDED STEEL for Greater Strength with Less Weight!

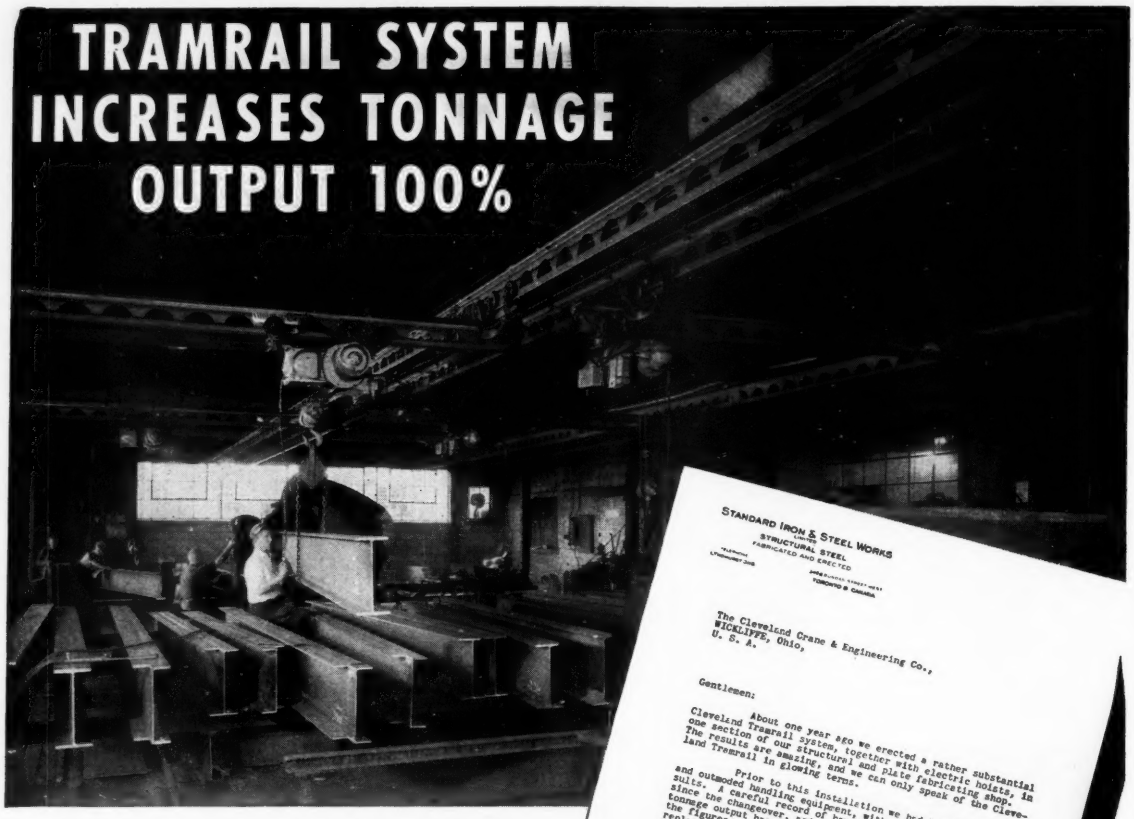
The eleven ton marine engine crankcase, illustrated above, is another excellent example of how Steel-Weld Fabrication can be employed to good advantage in many products. It is typical of parts and assemblies produced by Mahon for many manufacturers throughout the country. Do you have bases, frames or parts in your product that could be redesigned for more economical production in welded steel? . . . do you have a new product in the development stage where Steel-Weld Fabricated parts could reduce weight without sacrificing strength? . . . are you faced with a limited production on an item which makes pattern costs prohibitive? . . . if so, it will pay you to investigate Mahon facilities and technical services. You will find in the Mahon organization a unique source with complete, modern fabricating, machining and handling equipment to cope with any type of work regardless of size or weight . . . a source where skillful designing and advanced fabricating technique are supplemented by craftsmanship which assures you a smoother, finer appearing job, embodying every advantage of Steel-Weld Fabrication.

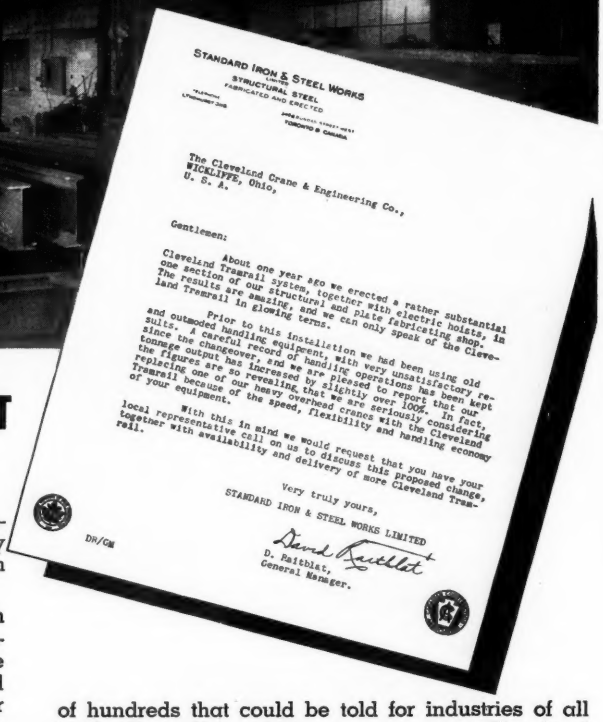
THE R. C. MAHON COMPANY
DETROIT 34, MICHIGAN

Engineers and Fabricators of Steel in Any Form for Any Purpose

MAHON

TRAMRAIL SYSTEM INCREASES TONNAGE OUTPUT 100%





STANDARD IRON & STEEL WORKS
STRUCTURAL STEEL
FABRICATED AND ERECTED

The Cleveland Crane & Engineering Co.,
WICKLIFFE, Ohio,
U. S. A.

Gentlemen:

About one year ago we erected a rather substantial one section of our structural and plate fabricating shop. Cleveland Tramrail system, together with electric hoists, in The results are amazing, and we can only speak of the Cleveland Tramrail in glowing terms.

Prior to this installation we had been using old and outmoded handling equipment, with very unsatisfactory results. A careful record of handling operations has been kept since the changeover, and we are pleased to report that our tonnage output has increased by slightly over 100%. In fact, the figures are so increased that we are serious. In considering replacing one of revealing that we are serious. In considering Tramrail because of the speed, flexibility and handling economy of your equipment.

With this in mind we would request that you have your local representative call on us to discuss this proposed change, together with availability and delivery of more Cleveland Tramrail.

Very truly yours,
STANDARD IRON & STEEL WORKS LIMITED
D. Haithiat,
General Manager.

DH/GM

STEEL FABRICATING PLANT AMAZED AT RESULTS

The tremendous way in which a Cleveland Tramrail system can cut costs has been convincingly proven to Standard Iron & Steel Works, a well known steel fabricator in Toronto, Ontario.

They replaced a standard I-beam crane system in a section of their plant with modern Cleveland Tramrail equipment. The easy, smooth operation of the new system and efficiency it introduced, enabled them to double their previous tonnage output. Their production costs were cut so drastically that the entire changeover in handling equipment was quickly written off.

The story of Standard Iron & Steel Works is typical of hundreds that could be told for industries of all kinds. Regardless of size or type, most Cleveland Tramrail installations pay for themselves in a few months—and they keep on paying handsome dividends year after year thereafter.

GET THIS BOOK!
BOOKLET No. 2008. Packed with valuable information. Profusely illustrated. Write for free copy.

CLEVELAND TRAMRAIL DIVISION
THE CLEVELAND CRANE & ENGINEERING CO.
7850 East 284th Street, Wickliffe, Ohio

CLEVELAND TRAMRAIL
OVERHEAD MATERIALS HANDLING EQUIPMENT

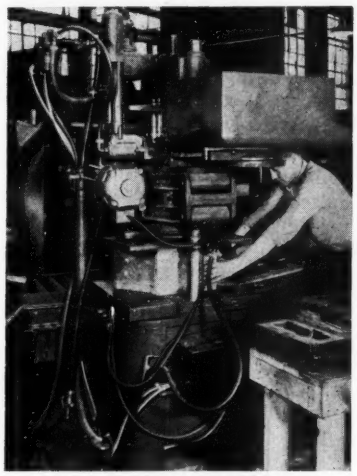
torque as indicated by an electromagnetic pickup.

Lighter Core Boxes

Controlled air pressure permits machine to blow in unrigged wooden boxes

CORE BLOWING MACHINE capable of blowing cores in unvented, unrigged wooden core boxes is a development of Federal Foundry Supply Co., Cleveland.

While core blowing machines have been used since 1903, cores were blown chiefly in more expensive metal or heavily reinforced wooden boxes. Air pressure necessary to produce cores in conventional blowers is so great that ordinary wooden boxes are blown apart.



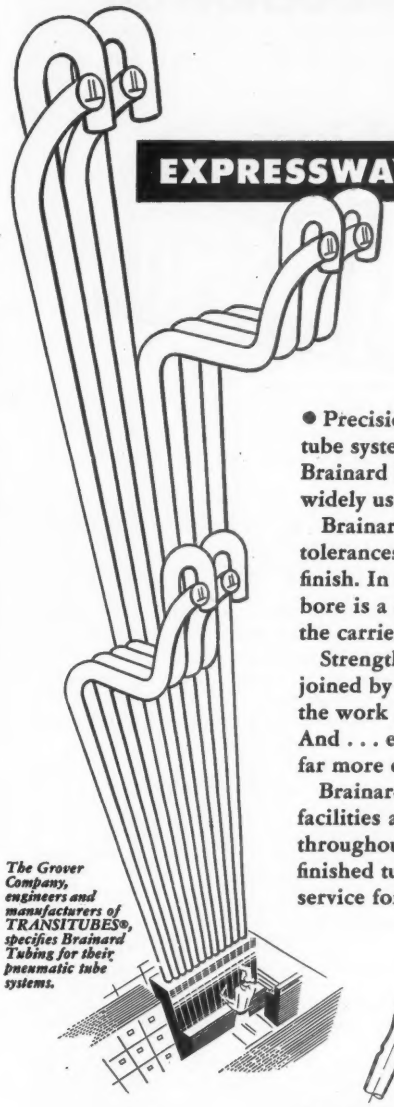
CONTROLLED PRESSURE
. . . several short, quick blows

Controlled Air Pressure—With its new machine, the Pulsator model San-Blo, Federal reports the same wooden boxes used by bench core makers for ramming sand by hand can serve for blowing cores. They need not be rigged specially in any way and rarely require venting. The company adds that one machine equals production of five or more bench core makers.

Machine blows cores with two, three or four short, quick blows, instead of filling the box cavity with one continuous blast. This makes it possible to control air pressure within the box, keeping it extremely low during the blowing cycle.

Automatic Blowing Cycle—Air

another job for Brainard TUBING



EXPRESSWAY FOR HOT MAIL

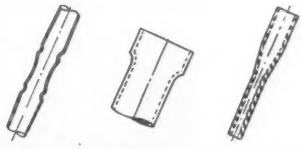
The Grover Company, engineers and manufacturers of TRANSITUBES®, specifies Brainard Tubing for their pneumatic tube systems.

● Precision is important in pneumatic tube systems . . . a big reason why Brainard Electric-welded Tubing is so widely used for this application.

Brainard Tubing is produced to close tolerances, with a smooth inside finish. In straight or bent sections, the bore is a smooth expressway for the carrier cylinders.

Strength is uniform. Sections can be joined by a variety of methods, simplifying the work of both designer and fabricator. And . . . electric-welded tubing is far more economical than other types.

Brainard's integrated production facilities assure quality control throughout manufacture . . . from ore to finished tubing. Depend on Brainard service for *your* needs.



EASY TO FABRICATE

Brainard tubing is a uniform product made to close tolerances. Has good machining qualities and finish can be supplied as specified. Easily fabricated—can be beaded, expanded, swaged, spun, flanged, upset, grooved, fluted, flattened, tapered, and otherwise formed. Supplied straight or fabricated, sizes ½″ to 4″ O.D.; .025 to .180 gage.

Fast delivery on certain sizes. For further information or catalog, write Brainard Steel Division, Sharon Steel Corporation, Dept. N-6, Griswold Street, Warren, Ohio.

Brainard
SHARONSTEEL
STEEL DIVISION
SHARON STEEL CORPORATION

WARREN, OHIO

DISTRICT SALES OFFICES: ATLANTA BALTIMORE BUFFALO CHICAGO CINCINNATI CLEVELAND COLUMBUS DAVENPORT DES MOINES DETROIT GRAND RAPIDS INDIANAPOLIS MILWAUKEE NASHUA NEW YORK PHILADELPHIA PITTSBURGH ROCHESTER SAN FRANCISCO SYRACUSE TOLEDO

for 50 to 1 reduction on OZALID STREAMLINER developer drives . . .

WINSMITH SPEED REDUCERS®

A copy in less than 30 seconds! Printing speed up to 14 ft. per minute! That's what this Ozalid Streamliner turns out for thousands of engineering, purchasing, personnel and accounting departments across the nation.

Because reproduction of letters, reports, drawings and records usually "can't wait", every component of Ozalid copying machines must be constantly relied upon to do its bit without failure. The Winsmith single reduction, 50:1 ratio, right angle drive, worm gear type reducer is a good example.

Serving the blower, developer and pump drive, which is powered by a 1/3 hp motor, this small, compact Winsmith unit is designed for the long-lasting service which Ozalid requires of all its components. Moreover, its vibrationless operation is necessary to the smooth, quiet performance for which the Streamliner is so well known. "We are pleased with the little servicing that these units have demanded over countless hours of usage", says Ozalid's chief engineer.

The importance that Ozalid, Division of General Aniline and Film Corporation, places on the selection of a speed reducer is typical of most industries . . . the very reason so many have become Winsmith users. Within the 1/100 to 85 hp range, no other speed reducer is available in so complete a selection of standardized types, sizes and ratings. *Catalog 148 will convince you.* Write!

WINSMITH, INC.
14 EATON ST.,
SPRINGVILLE (Erie County), N. Y.

Knotty Problems

MANUFACTURE of the new tank gun range finders by Airtemp Division, Chrysler Corp., Dayton, O., involves some tricky processes. One of these is the bonding of optical glass directly to the metal mounts without metal fasteners.

Another seldom-required process entails the production of accurate noncircular gears. In addition the entire instrument must be hermetically sealed against atmosphere.

valve and switch arrangement controls the blowing cycle automatically. It starts and stops the action to maintain pressure within the core box close to atmospheric pressure. Result, says Federal, is possible use of any wooden core box, with top and bottom parallel and assembled with nails or screws.

Equipment also features a mechanized sand magazine, using motor driven plows and an aerating air circuit to move sand to the blow hole and carry it into the core box. This gives the machine capacity to blow any core sand mixture that can be hand-rammed, with moisture content up to 8 per cent and green bond strength to 12 psi. It blows cores weighing from a few ounces to 40 pounds with one sand magazine.

Heat from the Ceiling

METAL MACHINING operations in Buick Motor Division's new Building 36 at Flint, Mich., promised to make design of a heating system difficult. Vaporization of cutting oils, a result of the machining, was the factor that caused the problem.

This vaporization results in a deposit of oil and dust on unit heaters, causing an almost immediate drop in heat output. Eventually it requires cleaning that might interfere with production.

Ceiling-Hung Radiator—To find the solution, engineers specified a simple overhead heating system of exposed pipes. The system consists of parallel runs of wrought iron pipe, totaling more than 75 miles in length, through which hot water is circulated. In effect, the

REPUBLIC UPSON NUTS AND BOLTS

Assembly of parts is easier and faster when bolts fit holes easily and accurately. Production lines move right along when every bolt fits the same, when every nut goes on smoothly and tightens up with uniform torque.

Over 20,000 shapes, kinds, and sizes of Republic Upson Nuts and Bolts let you give your product and your assembly line these cost-saving advantages.

REPUBLIC STEEL

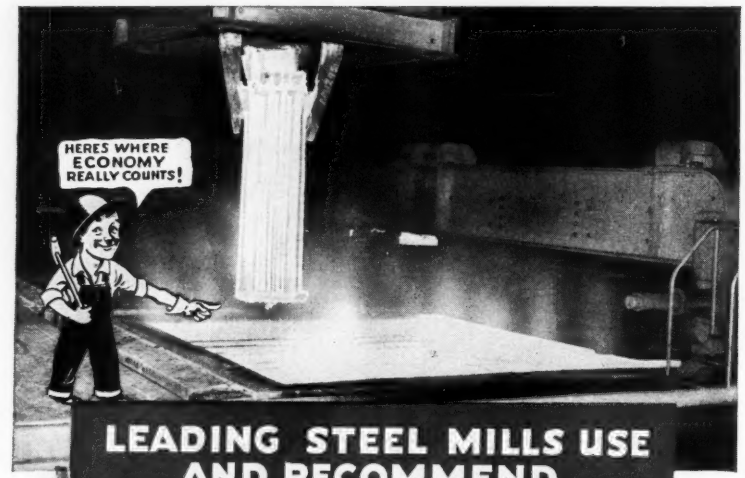
REPUBLIC STEEL CORPORATION
Bolt and Nut Division
CLEVELAND 13, OHIO • GADSDEN, ALABAMA
Export Dept.: Chrysler Building, New York 17, N. Y.

parallel runs make up a giant ceiling-hung radiator.

Coil water temperature is controlled from another building. There an indicator records outside temperature, as well as heat exchanger inlet and outlet temperature. Heat exchanger outlet temperature is varied inversely with the outside temperature according to a linear chart relationship. This is entirely manual.

Easily Maintained—The size of the piping limits the water temperature to 200° F with the steam valve full open. System is easily maintained and kept clean. It is out of the way for extensive remodeling required whenever a new engine design is adopted.

Buick's new heating system is based on a similar setup used in their Building 11, also in Flint. That building was erected in 1908 and its heating system of overhead wrought iron pipes fastened to ceiling joists has served without serious maintenance difficulties.



LEADING STEEL MILLS USE AND RECOMMEND
BUCKEYE SILICA FIRESTONE
FOR LONGER SOAKING PIT SERVICE

What features do you require in your soaking pit linings—savings in fuel costs? . . . greater mechanical strength and rigidity? . . . low first cost and shorter installation time? . . . corrosion resistance? . . . much longer life? . . . freedom from repairs? . . . these features and many more can be enjoyed by you after you install Buckeye Silica Firestone.

Performance records prove that Buckeye is the best. Heads of masonry departments appreciate and recommend this modern refractory's money-saving installation possibilities . . . operators know how much longer service can be expected from a Buckeye-lined pit!

Steel mill executives, who have used Buckeye Silica Firestone for years, will give you many reasons for your specifying this up to date, better lining material for your soaking pits. Our service engineers will gladly work with you to obtain the finest possible results from your Buckeye installation. Ask for this service.

THE CLEVELAND QUARRIES COMPANY
REFRACTORY DEPARTMENT
1740 E. Twelfth Street Cleveland 14, Ohio

Send for free literature today!

BUCKEYE
"FOR THAT EXTRA SERVICE"
SILICA FIRESTONE

CALENDAR
OF MEETINGS

June 22-24, Alloy Casting Institute: Annual meeting, The Homestead, Hot Springs, Va. Institute address: 32 Third Ave., Mineola, N. Y. Secretary: E. A. Schoefer.

June 23-26, Radio - Television Manufacturers Association: Annual convention, Palmer House, Chicago. Association address: 777 14th St. NW, Washington 5. Secretary: James D. Secrest.

June 23-27, American Institute of Electrical Engineers: Summer general meeting, Hotel Nicollet, Minneapolis. Institute address: 33 W. 39th St., New York 18. Secretary: H. H. Henline.

June 23-27, American Society for Testing Materials: 50th anniversary meeting and exhibit, Hotels Statler and New Yorker, New York. Society address: 1916 Race St., Philadelphia. Secretary: C. L. Warwick.

June 23-27, American Society of Mechanical Engineers: Oil & Gas Power Division conference, Hotel Statler, Buffalo, N. Y.

June 26-28, American Society of Mechanical Engineers: Western meeting, Applied Mechanics Division, University of California, Los Angeles. Information director: J. C. Dillon, Engineering Extension, University of California.

June 29-July 2, National Industrial Advertisers Association: Annual meeting, Palmer House, Chicago. Association address: 1776 Broadway, New York. Executive secretary: Blaine G. Wiley.

June 29-July 2, Caster & Floor Truck Manufacturers Association: Joint material handling, industrial meeting, Grand Hotel, Mackinac Island, Mich. Association address: 7 W. Madison St., Chicago 2. Secretary: Harry P. Dolan.

June 30-July 2, Materials Handling Institute: Annual meeting, Grand Hotel, Mackinac Island, Mich. Institute address: 731-732 DuPont Circle Bldg., Washington 6. Managing director: R. Kennedy Hanson.

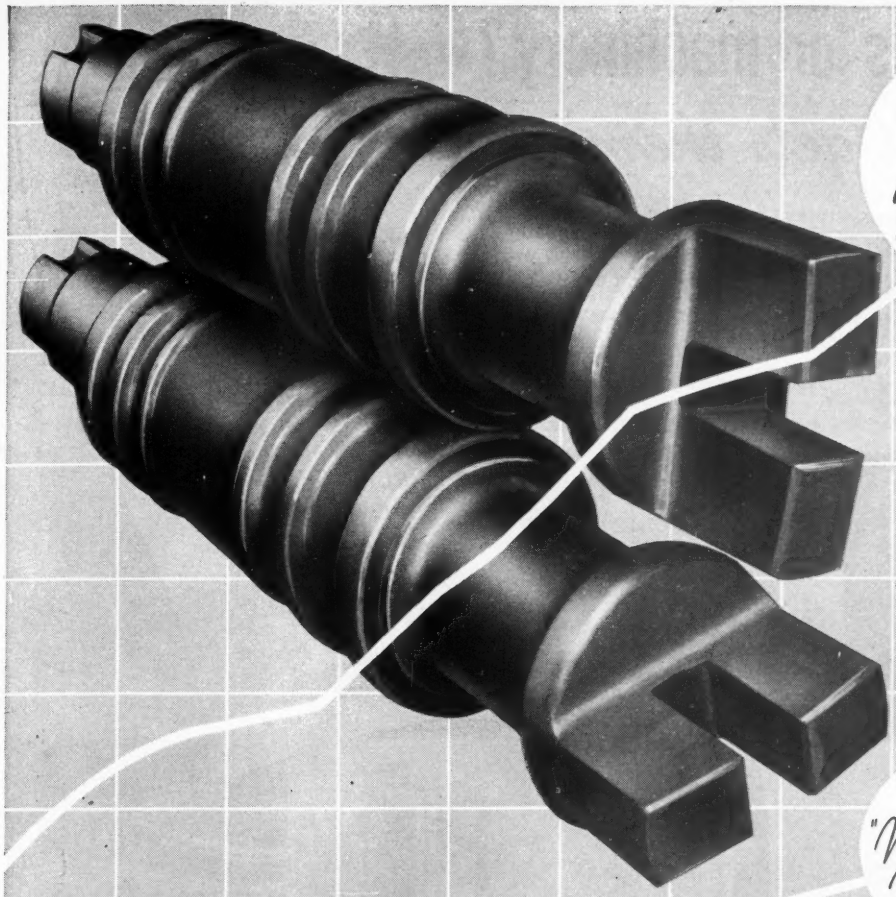
Intake Manifolds: 50 Per Hour

Intake manifolds are processed in two operations on a pair of new special machine tools delivered to an automobile manufacturer by Cross Co., Detroit.

First operation consists of milling the angular mounting pads and drilling the mounting holes. Second operation includes milling the choke and carburetor pads and water pipe connection; boring the water hole and carburetor holes; drilling, chamfering, reaming and tapping all other holes. Production rate hits 50 pieces per hour, at 100 per cent efficiency.

First machine is a dial type, using the Cross heavy-duty index table. Second is a Transfer-matic with parts automatically transferred from station to station. One unskilled operator is required for each machine.

One feature is the use of preset tools that reduce downtime and minimize scrap by avoiding the trial and error method of setup. Company's Toolometer is also used.



why you get "bonus" performance with

BIRDSBORO ROLLS

Topping "normal" production is easier when rolls are specifically designed and engineered to your own requirements. That's why you can *expect more* from Birdsboro Rolls.

From blueprint planning through analysis control for higher physicals, each step brings you closer to high, steady output with greater freedom from maintenance. If you're looking for long range rolling efficiency, at the lowest possible cost per ton—look to Birdsboro. The wide selection of Birdsboro alloy steel rolls, and copper grain rolls, assures you the rolling results you want.

Offices in:
BIRDSBORO, PA.
and
PITTSBURGH, PA.

BIRDSBORO
STEEL FOUNDRY & MACHINE CO.
Birdsboro, Penna.

ROLLS

Designers and Builders of:
Rolls • Crushing Machinery • Steel Mill Machinery
Hydraulic Presses • Special Machinery • Steel Castings

R-8-52

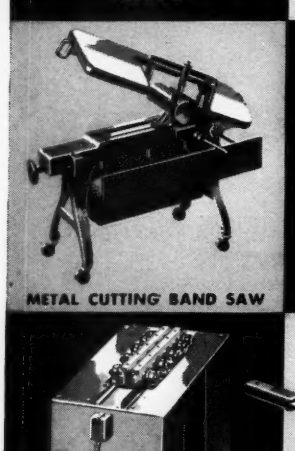
Need tools or machinery?

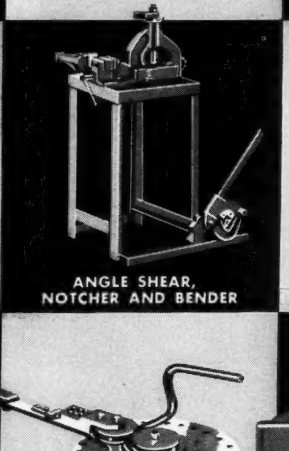
"One call gets them all!"

● It's faster and more convenient to use U.S. Steel Supply's "one call" service when you want tools and machinery for your plant maintenance or production needs. We have available a wide variety of top quality equipment that will meet your most exacting requirements. One call to your nearest U.S. Steel Supply office will bring quick delivery of most items in our diversified stock. One call gets them all!

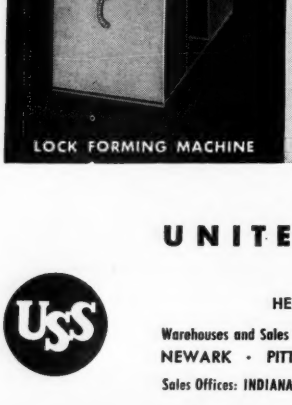
WRITE FOR FREE BOOK! You'll find plenty of helpful information in *Your Complete Guide to Metal Working Machinery and Industrial Tools.*

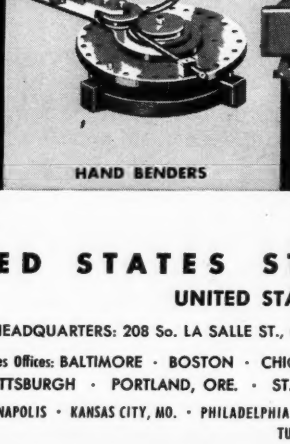
- Beading Machines
- Benders, Bar and Angle
- Brakes, Hand or Power
- "C" Clamps
- Crimpers
- Drill, Portable Electric
- Elbow Machines
- Expanded Metal
- Flanging Machines
- Galv-Weld
- Grinders, Portable Electric
- Grinding Wheels
- Hoists, Hand or Electric
- Lock Forming Machines
- Marking Crayons
- Notchers
- Punches, Hand or Power
- Punch Presses
- Rolls, Slip, Hand or Power
- Saws, Metal Cutting
- Shears, All Types
- Welding Electrodes
- Welding Machines


CLAMPS

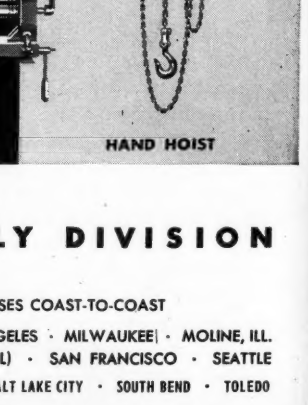

PORTABLE ELECTRIC SHEAR

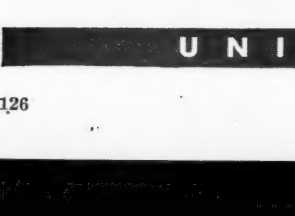
GRINDING WHEELS


METAL CUTTING BAND SAW

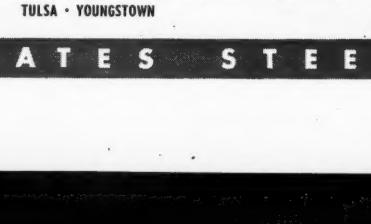

ANGLE SHEAR, NOTCHER AND BENDER

WELDING MACHINES


HAND PUNCHES


LOCK FORMING MACHINE

HAND BENDERS


SLIP ROLL

HAND HOIST

UNITED STATES STEEL SUPPLY DIVISION

UNITED STATES STEEL COMPANY

HEADQUARTERS: 208 So. LA SALLE ST., CHICAGO 4, ILL. WAREHOUSES COAST-TO-COAST

Warehouses and Sales Offices: BALTIMORE · BOSTON · CHICAGO · CLEVELAND · LOS ANGELES · MILWAUKEE · MOLINE, ILL. NEWARK · PITTSBURGH · PORTLAND, ORE. · ST. LOUIS · TWIN CITY (ST. PAUL) · SAN FRANCISCO · SEATTLE

Sales Offices: INDIANAPOLIS · KANSAS CITY, MO. · PHILADELPHIA · PHOENIX · ROCKFORD, ILL. · SALT LAKE CITY · SOUTH BEND · TOLEDO TULSA · YOUNGSTOWN

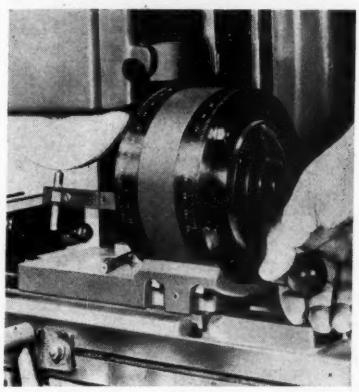
UNITED STATES STEEL

New Products and Equipment

Wheel Truing Attachment

USE REPLY CARD—CIRCLE No. 1

Continuous radius and tangent wheel truing attachment is offered by Brown & Sharpe Mfg. Co., Providence 1, R. I. The attachment is designed to form, with one continuous movement of the diamond, accurate radii on grinding wheels with accurate tangents at either



. . . forms accurate radii in one movement

or both sides of the radii. Truing unit is clamped firmly on the machine table by a single T-bolt. Accurate alignment is assured by two reversible tongues for T-slots ½ or 9/16-inch wide. These tongues are removed when the attachment is used on a magnetic chuck.

Convex radii can be formed up to ½-inch, with tangents to ⅝-inch in length at any angle from 90 degrees above horizontal to 20 degrees below. Concave radii can be formed from 5/32 to 1-inch, having tangents to ⅝-inch long at any angle from 90 degrees below horizontal to 20 degrees above. Angles of tangents are independent of each other.

Small Parts Finishing System

USE REPLY CARD—CIRCLE No. 2

Small parts can be finished at a rate of 1440 per hour through a system announced by Cincinnati Cleaning & Finishing Machinery Co., Schmidt Bldg., Cincinnati, O. The equipment washes, phosphatizes, rinses and dries parts, then dip paints, drains and bakes them and returns them to the loading station. Machines are designed specifically for parts that are to be finished.

Lathe Line Redesigned

USE REPLY CARD—CIRCLE No. 3

Atlas Press Co., 2395 N. Pitcher St., Kalamazoo, Mich., announces several refinements in its line of 12-inch Clausing precision lathes. Model 6300 (see cut) features a forged, ground steel spindle with 1-inch collet capacity. Timken tapered roller bearing equipped spindle and lead screw are employed. It has outboard drive, with

. . . countershaft or variable speed drive

dual A-belts driving the spindle pulley. Choice of countershaft or variable speed drive is available.

In the 4800 series, Timken roller bearing spindle is threaded and has ½-inch collet capacity. Automatic apron is double-walled and gears and shafts are splash lubricated. Built-in countershaft is equipped with friction clutch and brake.

High-Speed Copying Machine

USE REPLY CARD—CIRCLE No. 4

Introduction of the model 30 Copyflex, a machine designed for use by engineers and draftsmen, is announced by Charles Bruning Co. Inc., 125 North St., Teterboro, N. J. Model has a full 46-inch printing width to handle standard 42-inch roll stock or insertion of multiple cut sheets of copying paper. Its 48-inch, 2000-w mercury arc lamp provides uniform exposure and permits printing speeds to a maximum 12 linear feet per minute.

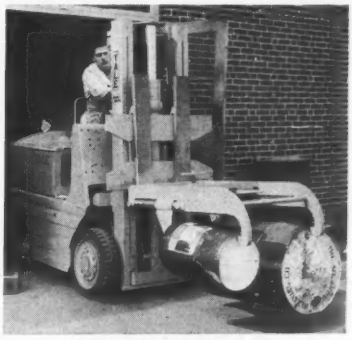
Machine requires no installation. It operates on connection to a 230-v, 60-cycle ac line. Fifty-cycle machines are also available. Copies can be made on sensitized and acetate-coated paper, film and cloth.

Drum Handling Attachment

USE REPLY CARD—CIRCLE No. 5

Completely automatic, mechanically-operated drum handling attachment is available from Yale & Towne Mfg. Co., Philadelphia 15, Pa. Attachment is capable of carrying different size drums two at a time. Operation requires no special hydraulic system components. Unit clamps directly on the forks.

In operation, the driver tilts the mast backward, engaging the rear



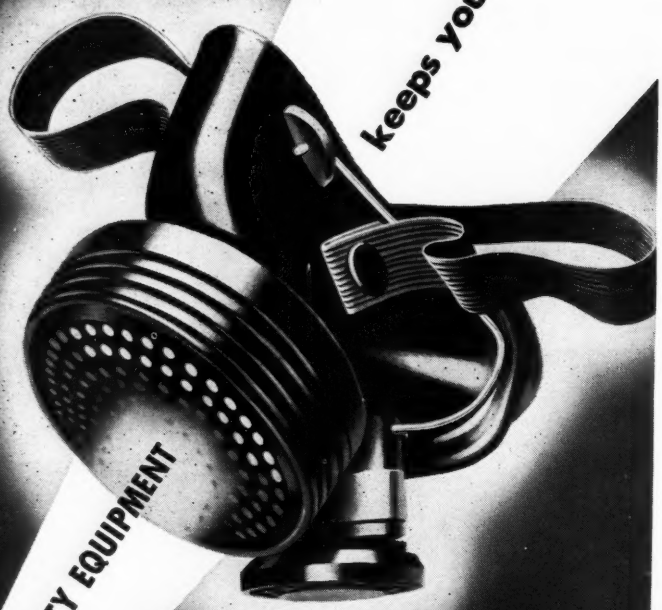
. . . carries different sizes, two at a time

hook on each boom of the attachment with the near end of each drum. By moving the truck forward and tilting the mast in the same direction, front hooks are engaged. Long tension springs keep rear hooks in contact with drums. Weight of the load locks the rear hooks for positive grip.

REPLY CARDS

on page 141 will bring you more information on any new products and equipment in this section.

WILLSON®
dependable
respiratory protection
keeps you on the safe side
WILLSON SAFETY EQUIPMENT



Like these comfortable respirators, all Willson safety equipment is made after careful study of industry's needs. Through this continuing research you get many comfort and safety improvements first in Willson products. Ask for Willson—largest line of respirators for industry, farm and home use.

Universal Gas Mask Style WUG
Approved by U. S. Bureau of Mines for toxic smokes and gases, including carbon monoxide.

Chemical Cartridge Respirator No. 831
Protects against common industrial gases and vapors in low concentration. New molded rubber facepiece with flexible rolled edge for extra comfort. Bureau of Mines Approval No. 2302.

No. 880 for metal fumes, mists and dusts
Same facepiece as No. 831, with replaceable dust filters. Comfortable under welding helmet. Bureau of Mines Approval No. 2149.

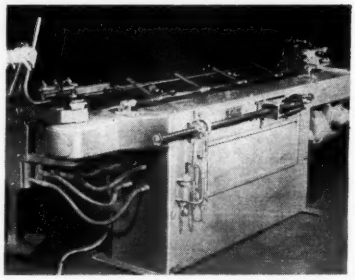
WILLSON PRODUCTS, Inc., 233 Washington St., Reading, Pennsylvania
See your WILLSON distributor or write for catalog

To deposit the load, this procedure is reversed.

Production Bending Machine

USE REPLY CARD—CIRCLE No. 6

Tube bender offered by Pines Engineering Co. Inc., 601 Walnut St. Aurora, Ill., occupies 30 per cent less floor space than former units. Its operating circuit permits individual control of all functions at any time during the cycle. Circuit employs an additional push-button control panel that enables the operator to stop, start or reverse the cycle at any given point, allowing tooling results to be checked easily.



. . . occupies 30 per cent less floor space

Another feature is a new pick-off angle-of-bend turret and a removable location-of-bend stop assembly for repeat setups. Machine occupies 33 x 130 inches floor space, accommodating a 7-foot length tube over mandrel. Bending arm speed is 25 rpm. A calibrated scale for quickly setting the degree of bend is optional.

Automatic Dehumidifier Control

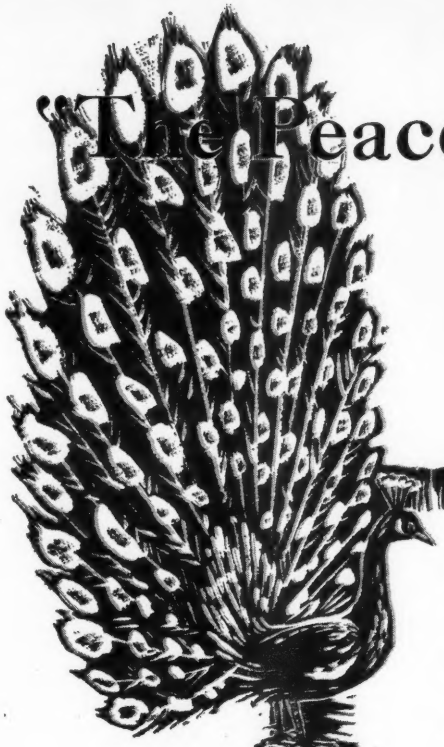
USE REPLY CARD—CIRCLE No. 7

Abbeon Supply Co., 179-15 Jamaica Ave., Jamaica 32, N. Y., offers its model WA-5 dehumidifier. Unit is available with control unit built into the front as a permanent part. To operate, it is necessary only to make the electrical connection and set the control for automatic operation. The dehumidifier can also be supplied with an optional plug-in control. In this instance, automatic operation results when control and dehumidifier are connected.

For continuous or intermittent operation without automatic control, unit is plugged into a 110-v, ac outlet and switched on or off

"The Peacock's Complaint"

has a moral for Cutting Fluid users



Aesop's Story:

Among the fables of Aesop, is the story of the Peacock that lamented to the Goddess of the Birds its inability to sing like the Nightingale. Finally, losing patience, the Goddess rebuked the magnificent bird, saying, "Peacock, none of us can have *all* the fine qualities. The Nightingale is musical, the Eagle is powerful, the Owl is wise, while you are most beautiful of all the birds. Be content, for had you the voice of the Nightingale, you could not have your own beauty."

The Moral:

Just as the Peacock in Aesop's fable excelled in beauty of plumage but not of voice, so does no single cutting fluid excel in every desired characteristic.

For example, in machining tough, stringy materials, a cutting fluid must have high anti-weld characteristics to prevent scuffing and resultant poor surface finish. However, on free machining materials the anti-weld requirement must be balanced for maximum tool life consistent with desired finish.

The fable simply points up the fact that there is no *universal* cutting fluid to give best results on every job.

The Stuart Oil Co. and its representatives offer you no compromise products. They are prepared to help you correctly select and apply the cutting fluids that will give you the best possible results on *your* particular work.

More Than a "Coolant" is Needed

D.A. Stuart Oil CO.
EST. 1865 LIMITED

TIME-TESTED CUTTING FLUIDS AND LUBRICANTS

2735-37 S. Troy St., Chicago 23, Ill.

SEND FOR BOOKLET entitled *More Than a "Coolant" is Needed*

CLIP TO YOUR COMPANY LETTERHEAD AND MAIL

to D. A. Stuart Oil Co., Ltd., 2735-37 S. Troy St., Chicago 23, Ill.

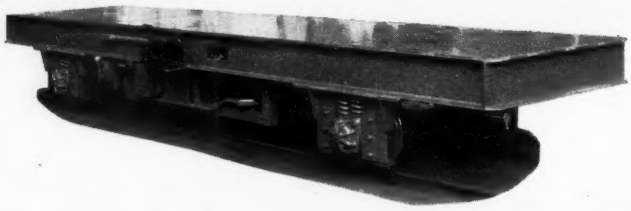
Your Name .....

Title .....

WALK-ALONG SAFETY TYPE FLAT CARS adapted to your HAULAGE NEEDS

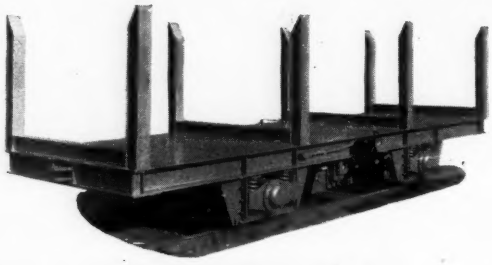
ATLAS CARS

Atlas Walk-Along storage battery operated flat cars show considerable savings over other methods of handling heavy, bulky loads over short distances. They are safe to use because operation is controlled by one lever and they travel no faster than a man can walk.



20-TON BATTERY OPERATED

The steel plate deck section over battery and charging equipment is removable for easy access. Plug-in connection to automatic battery charger on car is located conveniently at side of car next to ampere hour meter. Car moves at slow speed in direction controller lever is moved and stops when lever is released.



40-TON BATTERY OPERATED

This safety-type flat car is equipped with side stakes and cross bunks so that crane slings may be inserted to handle loads. Deck section is hinged to provide access to equipment, including automatic battery charger which may be plugged into plant circuit whenever car is at rest so that car is available for 24-hour service. Car can be furnished with plain deck, operator's platform, or other special features if required.

THE ATLAS CAR & MFG. CO.

ENGINEERS MANUFACTURERS

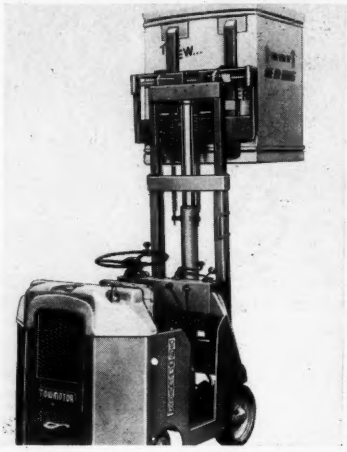
1140 IVANHOE RD. CLEVELAND 10, OHIO, U. S. A.

as conditions dictate. Moisture pan can be eliminated by use of a fixture for attaching a length of hose or pipe.

Attachment Handles Cartons

USE REPLY CARD—CIRCLE No. 8

Lift attachment made for handling heavy cartons without pallets is announced by Towmotor Corp., 1226 E. 152 St., Cleveland 10, O. Pallets are eliminated and two cartons lifted simultaneously by placing the lift in contact with the bottom carton, then raising the



. . . moves heavy pieces without pallets

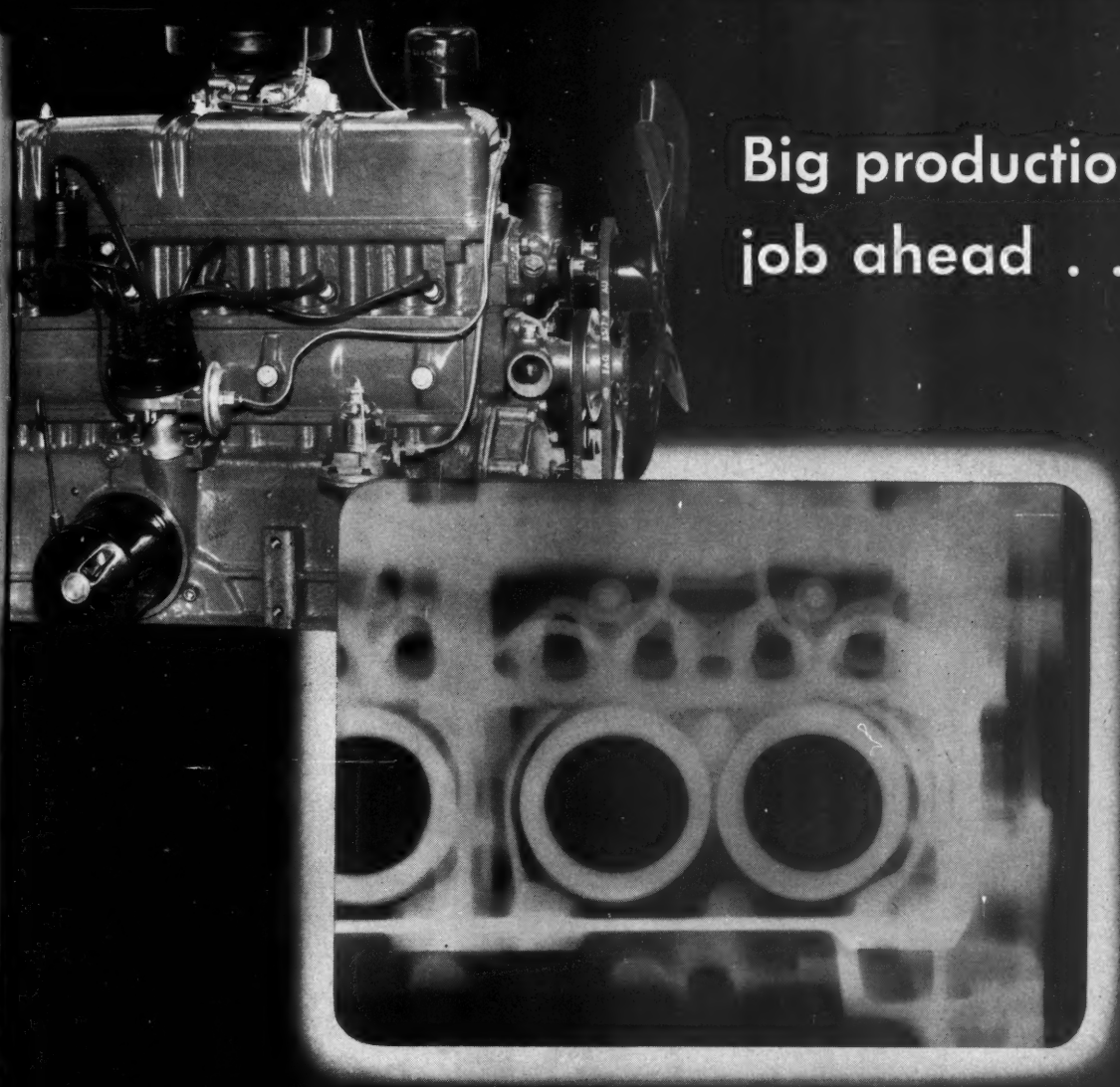
carriage. This moves the spade-like arms of the carton lift up and under interlocking cover flange.

Base supports are designed to slide on the spade arms. Thus, when the load is raised, weight of these base pieces causes them to remain near the bottom of the carton, assuring maximum load stability. To provide versatility, the carton lift is easily interchangeable with standard forks. Its arms can be adjusted laterally to handle cartons of varying widths.

Vertical Honing Line Expanded

USE REPLY CARD—CIRCLE No. 9

Addition of the model D-12 to its line of vertical honing machines is announced by Staple Engineering Co. Inc., 1315 S. Woodward Ave., Birmingham, Mich. Model's range extends from 1¼ through 4 inches diameter; a 10-stroke is electrically controlled, hydraulically operated. Spindle drive operates through spiral gears and v-belts, with pick-off sheaves for speed change. A



RADIOGRAPHY checks procedure

Here you see a radiograph of a car engine block. It was a new design—almost ready for production. It was important that it be sound, free from sand or gas holes—and with no core shifts.

To be sure, pilot castings were radiographed. It was the one way to know these internal conditions without destroying the casting.

More and more foundries are making radiography a routine procedure. It is the way to be sure only high-quality work is released. In production runs it indicates ways in which methods can be improved and yield increased.

If you would like to know how radiography could improve your plant operation, talk it over with your x-ray dealer. Also, if you wish, we'll send you a free copy of "Radiography as a Foundry Tool."

EASTMAN KODAK COMPANY
X-ray Division, Rochester 4, N. Y.

Radiography . . .

another important function of photography

Kodak
TRADE-MARK

Why accept this?... when you actually want this?...

CARMET *blanks are preformed to your order!*

ATTENTION INDUSTRIAL DISTRIBUTORS:

Ask us about handling CARMET standard tools and blanks in your area. Some territories are open. Write, phone, or wire.

ADDRESS DEPT. S-30

Above are shown two carbide metal rolls of identical composition. The one at the left cost the user about nine times as much as the one at the right. That differential was due solely to grinding vs. non-grinding. The plain face needed serrating, whereas the ready-toothed face needed nothing.

In many uses where tolerances are not too critical, CARMET blanks *preformed* to your specifications are ready for service without additional costly grinding. On jobs where finish grinding is necessary, the quality of Carmet's preforming holds grinding stock to a minimum.

Hundreds of special shapes can be preformed in Carmet. For practical suggestions that fit your needs, call or write your nearest A-L representative.

● *Allegheny Ludlum Steel Corporation, Carmet Division, Wanda & Jarvis Avenues, Detroit 20, Michigan.*

For complete **MODERN** Tooling, call

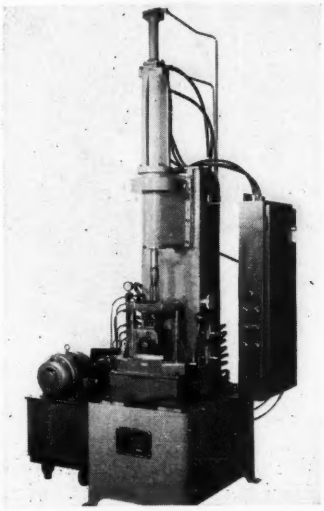
Allegheny Ludlum

W&D 4048

AL FINE TOOL STEELS SINCE 1854

3-hp motor (1200 or 1800 rpm) is standard for the spindle drive.

Separate unit driven by a 2-hp motor supplies hydraulic pressure for reciprocating the spindle and for stone feed-out. Hydraulic oil capacity is 30 gallons. Pushbutton controls are used for starting, stopping, inching and withdrawing the spindle. In automatic operation, one button controls the complete cycle.



. . . model's range: 1¼ to 4 inches diameter

High-Speed Marking Device

USE REPLY CARD—CIRCLE No. 10

Manual device for marking metal bars, tubes, rods and sheets at high speed is introduced by Adolph Gottscho Inc., Hillside 5, N. J. Marker imprints a permanent legend 3/16-inch deep by 8 inches long in a continuously repeated pattern. Called Rolamarker 601, the device automatically reinks the printing type around its diewheel after each complete impression. A twin-roll inking system provides for continuous feed without danger of over or under-inking the type. Rubber type has a patented groove base to hold it securely to the diewheel.

Welders Silicone Insulated

USE REPLY CARD—CIRCLE No. 11

Redesigned line of alternating current welders is announced by Metal & Thermit Corp., 100 E. 42nd St., New York 17, N. Y. First of three features incorporated in the redesign is insulation with silicone. Material is applied to provide greater overload capacities, permit more contact, lighter weight and prolong welder life. Another improvement is combination of low open circuit voltage with arc stabilization. This is done by incorporating capacitors in the secondary circuit to gain an extra surge of current to eliminate pop-outs.

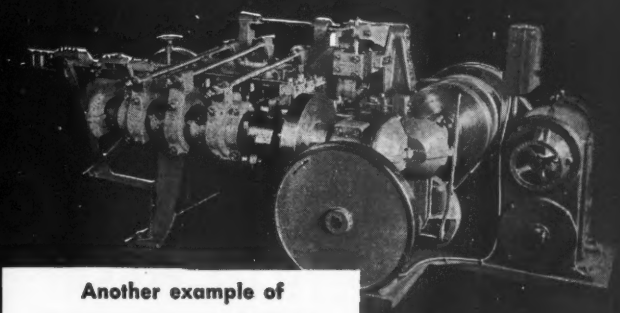
Third feature is automatic hot-start. This makes arc striking easier by providing the correct amount of current boost to start the arc at any current setting without manual adjustment. Device is a simple relay and resistor combination connected across the transformer secondary in series. It is fully automatic in operation. Line includes 200, 300, 400 and 500-amp ratings.

Surface Grinding Machine

USE REPLY CARD—CIRCLE No. 12

Surface grinder designed for fast, accurate generation of flat surfaces on various metal parts is announced by PDQ Grinder Co., 6

PRODUCTION RECORDS *Broken*
with NILSON 4-SLIDE *Machine!*



Another example of
FASTER, LOWER COST FORMING
of Ribbon Metal Stock

180 Terminal Contacts Per Minute

7 Separate Operations Eliminated

A famous national manufacturer tripled production of the Terminal Contact illustrated above (in actual size) and reduced production costs proportionately by replacing several progress die set-ups with one Nilson 5-3-F four side machine. *Seven separate operations were eliminated;* 180 completed contacts produced per minute. Time required for tooling changes was reduced 50% over similar type machines.

This example clearly shows the big savings you can make in overhead, maintenance, labor and time with a Nilson 4-slide!

Taking stock directly from the coil, NILSON metal ribbon stock four-slide machines automatically feed, straighten, pierce, blank, swage, stamp, coin, cut off and perform up to five forming operations with speed and accuracy. Built in five models with capacities up to 2½" wide and feed lengths up to 15". For specific recommendations on your wire and ribbon metal forming problems, send details, prints or samples of your operation to us when you request the bulletin.

THERE'S NOTHING LIKE A NILSON

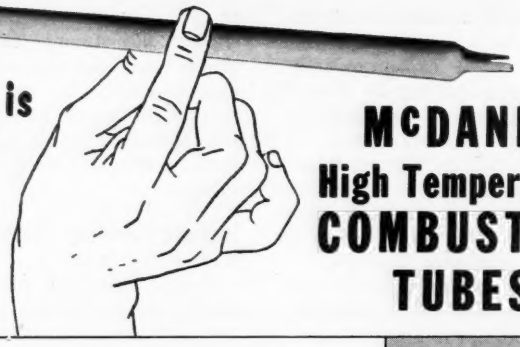
Specialists in Wire Forming Equipment for Over 50 Years

THE A. H. NILSON MACHINE COMPANY

1506-D RAILROAD AVENUE, BRIDGEPORT 5, CONNECTICUT

OTHER NILSON PRODUCTS:

- Automatic chain-making machines
- Automatic staple forming machines
- Wire and Stock reels
- Foot Presses
- Wire straightening equipment
- Slide Feeds for Presses



This is IT

McDANEL High Temperature COMBUSTION TUBES

In carbon and sulphur analysis work McDanel Tubes give all-out service.

Precision made in every detail—non-porous, gas tight and highly refractory, McDanel Tubes never spall or blister.

Case histories in hundreds of Laboratories throughout the country prove

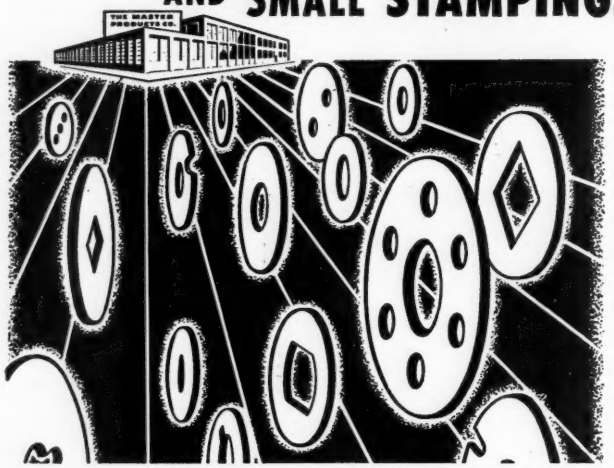
- GREATER EFFICIENCY
- LONGER LIFE
- LOWER COSTS

McDanel Tubes, Flasks, Retorts, Crucible, etc., are immediately available. Facilities also for the production of Refractory Porcelain Specialties to meet specific needs.

Write today for catalog

McDANEL REFRACTORY PORCELAIN CO.
BEAVER FALLS, PENNA.

STANDARD AND SPECIAL WASHERS AND SMALL STAMPINGS



More than 30 years of experience in designing and producing Special Washers and Small Stampings . . . more than 12,000 sets of tools at your disposal. Any metal . . . any quantity. *Your inquiries will receive prompt and careful attention.*

THE MASTER PRODUCTS CO.
6400 Park Avenue Cleveland 5, Ohio

Manhasset Ave., Pt. Washington, N. Y. Cylinder-type grinding wheel is mounted in a vertical plane and recessed within grinding table's work surface. Machine's 12-inch diameter cylinder-type grinding wheel finishes surfaces as wide as 9½ inches. Amount of stock re-

. . . employs cylinder-type grinding wheel

moval is regulated by positive feed control governing the depth of cut for various work classes.

Work table's removable front section permits grinding parts that have side obstructions or angular surfaces. By removing this section, shoulders can pass within the area of the machine and in many instances surfaces at right angles can also be ground at the same time. When extra-width capacity is necessary, the entire guide fence can be raised to make possible a full 12-inch grinding width.

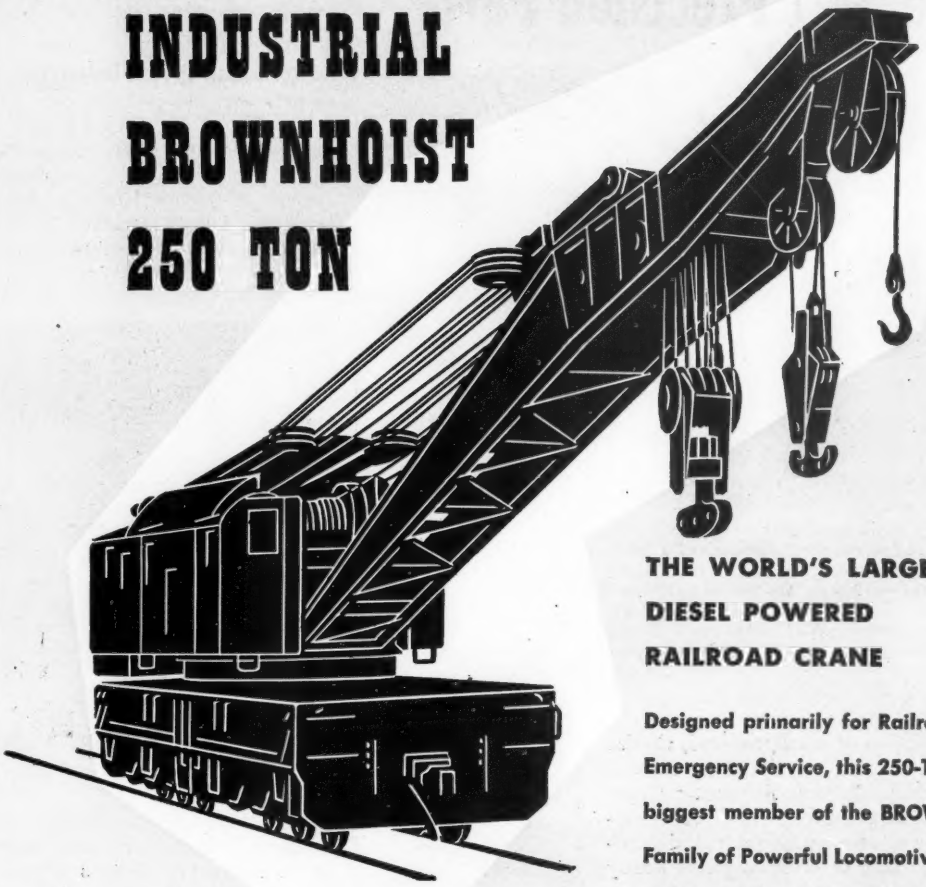
Collector Develops 5500 cfm

USE REPLY CARD—CIRCLE No. 13

Self-contained dust collector for use in industrial dust control requiring 5500 cfm of air is added to the line made by Aget-Detroit Co., 139 Main St., Ann Arbor, Mich. Collector develops rated 5500 cfm at 4 inches of water on a 12-inch inlet. It is available as a complete unit, with motor-driven fan, cyclone separator and dust storage compartment.

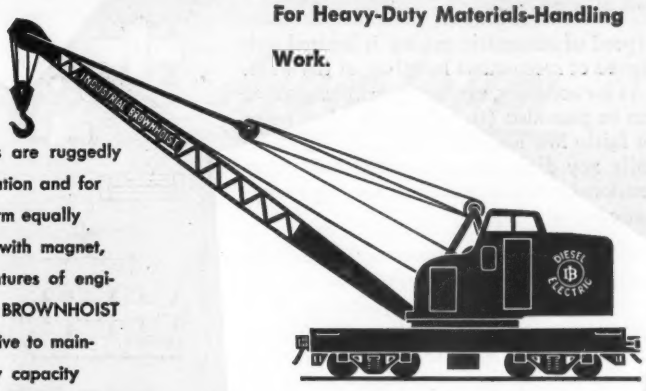
Designated the Dustkop model 50N60, it requires 38 x 66-inch floor space. Over-all height to the top of sleeve is 94 inches. Both inlet and outlet sleeves are sized to fit standard sheet metal pipe. Model is equipped with a 10-hp con-

INDUSTRIAL BROWNHOIST 250 TON



THE WORLD'S LARGEST DIESEL POWERED RAILROAD CRANE

Designed primarily for Railroad Emergency Service, this 250-Ton Crane is the biggest member of the BROWNHOIST Family of Powerful Locomotive Cranes For Heavy-Duty Materials-Handling Work.



Brownhoist Diesel Locomotive Cranes are ruggedly built for continuous, heavy-duty operation and for long, dependable service. They perform equally well as switch engine or crane and with magnet, hook or bucket. Many advanced features of engineering design and construction make BROWNHOIST Cranes easy to operate and inexpensive to maintain. Standard models to meet every capacity requirement. Write for complete information.

BROWNHOIST builds better cranes

CLAMSHELL BUCKET

COAL-ORE BRIDGE

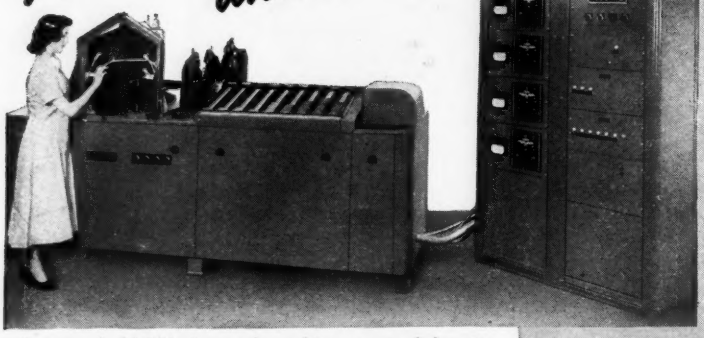
CAR DUMPER

INDUSTRIAL BROWNHOIST CORPORATION, BAY CITY, MICHIGAN • DISTRICT OFFICES: New York City, Philadelphia, Cleveland, San Francisco, Chicago; Canadian Brownhoist Ltd., Montreal, Quebec • AGENCIES: Detroit, Birmingham, Houston, Los Angeles.

150

Gage and Sort Precision Parts

Automatically and at High Speed

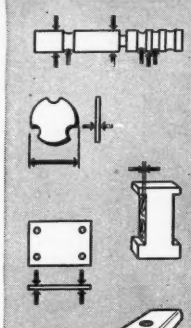


At a speed of 3,000 plus per hour this conveyor-fed multi-inspection gage measures and sorts piston pins for hardness, triangular out-of-round, taper and diameter along the full length of the workpiece. The pins are automatically sorted into ten disposal units: out-of-round, tolerance .00005"; taper, tolerance .0001"; hardness, O.K. and "bad"; diameter, five groups of .0001" difference, plus over and under.

The final inspection of mass-produced, similar parts is automatically accomplished by Federal Gaging and Sorting. Federal Automatic Gages reduce non-productive inspection time, effect substantial savings in subsequent assembly, and eliminate useless machining of outsized pieces finally discarded as scrap.

The speed of automatic gaging is limited only by the speed of mechanical handling of the workpieces. As for accuracy, extremely high magnifications can be provided (in millionths when necessary) or fairly low magnification and long range. Practically any dimension or several dimensions or dimensional conditions can be gaged by Federal Automatic Sorting Gages.

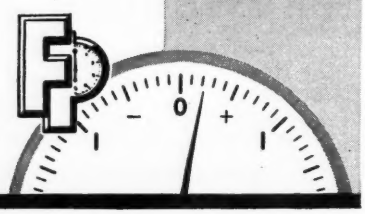
We have had extensive experience in the design and manufacture of high speed automatic and sorting gages and can recommend equipment to answer your particular needs. Write us for information on all types of automatic gages including multi-dimension, continuous measuring, machine control and automatic sorting gages. Federal Products Corporation, 1216 Eddy St., Providence 1, Rhode Island.



A few of the many dimensional inspections possible with automatic and sorting gages.

FEDERAL

Largest manufacturer devoted exclusively to designing and manufacturing all types of DIMENSIONAL INDICATING GAGES.

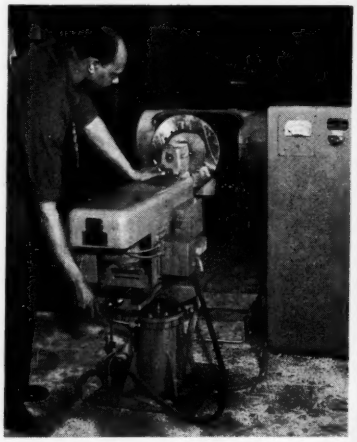


tinuous motor that drives the paddle wheel, self-clearing fan through a series of v-belts.

Power Brush Speeds Deburring

USE REPLY CARD—CIRCLE No. 14

Power brushing setup, designed to provide a mass production method for deburring gears, is a development of Osborn Mfg. Co., 5401 Hamilton Ave., Cleveland, O. The method uses a universal workpiece holder and brushing lathe setup to



. . . employs universal workpiece holder

remove sharp edges and burrs from gears of all shapes and sizes. Operator's entire job consists of placing the gear on the holder and pressing a button. Holder rotates the gear and presents it to the brush. A preset timer retracts the holder and motion is stopped until reactuated by the operator. Amount of brushing each gear receives depends on type of gear, metal and the surface desired.

Work can be presented to the brush at any angle to achieve desired brushing action. During actual brushing, work is power-rotated against the brush face by a motor drive built into the top slide. To maintain brushing strength at a high level over long periods of time, direction of brush rotation is reversed automatically each time holder presents work to the brushes.

Dual-Purpose Portable Furnace

USE REPLY CARD—CIRCLE No. 15

Improved portable furnace that furnishes heat in winter and circulates cool air in summer is an-

Here comes Aluminum

The amount of electricity it takes to produce one ton of aluminum is enough to light your house for 15 years! Thus aluminum production takes a lot of water power.

The torrent above is a view of the mighty Saguenay River, which turns the turbines of the 1,500,000-horsepower Shipshaw hydroelectric plant that supplies power for the Aluminum Company of Canada—one of the world's great aluminum producers.

Alcan, as most of us in the business call it, is one of the Aluminium Limited companies, whose products we distribute.

Utilizing great power resources and modern production facilities, we are supplying millions of pounds of aluminum which are being employed to strengthen transportation, essential industry, and military security. At the same time, we are striving to relieve the shortage of aluminum for the thousands of other uses where its qualities are desirable—and desired.

ALUMINUM IMPORT CORPORATION

Distributing company, in the Western Hemisphere, of the **ALUMINIUM LIMITED** *group*

Offices and agents in 40 cities
630 Fifth Avenue, New York 20

Av. Ing. Luis A. Huergo 1279, Buenos Aires

Cable address: ALIMPORT
Rua Da Quitanda 96, Sao Paulo

nounced by Fageol Heat Machine Co., Detroit 11, Mich. Called model 189, the dual purpose unit delivers 189,000 Btu per hour. This is 49,000 Btu greater than capacity of the company's previous models. Machine sprays heat at the floor level over an area approximately 3000 sq ft.

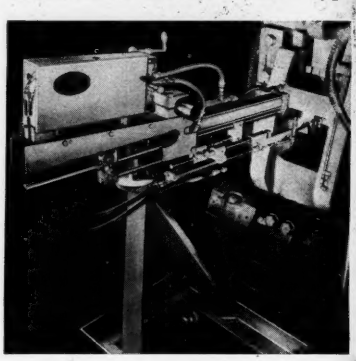
Simple change in the top blower mounting converts the model to a cool air blower. In this capacity, the machine delivers 1500 cfm of cool air.

Portable Automatic Unloader

USE REPLY CARD—CIRCLE No. 16

Unloader that can be wheeled up to small and medium size presses to remove small parts automatically is introduced by Sahlin Engineering Co., 267 Ferndale St., Birmingham, Mich. Machine is offered as companion equipment to the company's line of swinging-arm automatic unloaders. It consists of the same jaw, air cylinder and electric control assemblies used on these previous machines. It can be adjusted up and down to reach various die levels and can be set at any angle required. Straight-line jaw travel is especially suited for removing small parts at high speed. Applications are indicated where it is impractical to eject parts mechanically, through a bed opening or by gravity.

Unloader is mounted on a heavy steel frame, riding on four caster-type wheels. Built-in locking device is provided. Gripping jaw designs of several types are available for special unloading conditions. These include a hook type for application where a gripping edge is lacking; neoprene-tipped grip to protect parts with special finishes; pivot type that can be swiveled laterally to clear tight die areas; and confined type that locks a vertical flange stamping without damaging edges.



. . . removes small parts from medium presses

Drum and Barrel Sling

USE REPLY CARD—CIRCLE No. 17

Palmer-Shile Co., Detroit 27, Mich., offers a sling for loading and unloading trucks and for general purpose handling. It will also handle drums for draining purposes. It can pick up a drum or barrel from lying position and set it on end.

Dead Center Lubricant

USE REPLY CARD—CIRCLE No. 18

Molykote-Centerlube, a lubricant for dead center lubrication wherever loads and speeds are beyond capacity and temperature ranges of conventional center lubricants is announced by Alpha Corp., Greenwich, Conn. Basic ingredient is Molykote type Z, a lubricating grade of molybdenum disulphide

FROM STRIP
TO TUBES & SECTIONS
in your own mill
By installing Henderson Tube Making Machinery you can produce tubes and sections in any shape, in any diameter between ½" and 4½" and automatically cut-off to your exact requirements at speeds up to 130' per minute.
Henderson Machines include:
Electric Fusion Tube Mills for steel tubes.
Atomic Arc Tube Mills for tubes in alloy steels such as stainless, chrome-molybdenum, etc.
Section Rolling Machines for cold rolled section in Ferrous or any other ductile material.
Air Hydraulic Presses (4 ton) for Tube manipulation.
2-Spindle De-Frazing Machines for de-Frazing the inside and outside ends of tubes.
HENDERSON
TUBE MAKING MACHINERY
Illustration shows Henderson Electric Fusion Tube Mill which provides a continuous operation from the strip to the finished tube and all under the control of one operator. Electronic control of weld-heat is instant and stepless.
TUBE MAKING MACHINES LIMITED
BLAENRHONDDA, GLAMORGAN, WALES. Telephone: Treherbert 292/3. Telegrams: Tubemac, Treorchy.

PROBLEM: Armor plate for eyes

ANSWER: If you dropped steel balls on *your* glasses, they'd shatter in dangerous splinters. AO safety-goggle lenses won't splinter. Scientists at American Optical devised a heat treatment that makes glass many times as strong, eyes safer.

PROBLEM: A hemoglobin laboratory for use at patient's bedside

ANSWER: Today, a physician need not send blood samples to a laboratory for hemoglobin analysis and delay diagnosis. Within 3 minutes, he can read the answer in the Hb-Meter. This meter is so fast that a patient's condition can be watched during treatment. Heart of the instrument is an accurately polished glass wedge, graded in color, against which the blood sample can be matched. The Hb-Meter is a creation of American Optical Company.

PROBLEM: To keep movie film from catching fire

ANSWER: *Right,* film shielded by ordinary glass catches fire. *Left,* AO heat-absorbing glass prevents fire. This glass, developed for floods and projectors, absorbs 90% of heat from projected light, passes movie-film color in true values. Write us about your development problems. American Optical Company, 56 Vision Park, Southbridge, Mass.

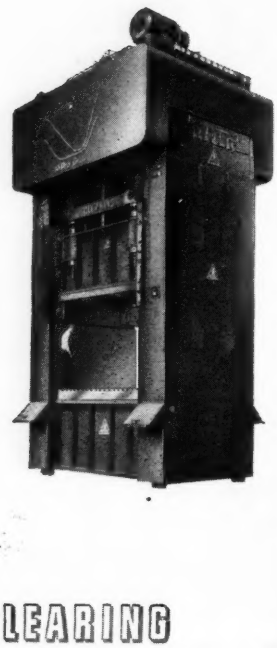
American Optical

advice to city fellers from Farmer Brown

As an expert in production or mass marketing Henry Brown couldn't qualify for a job in the smallest manufacturing concern, yet he knows something that no industrial manager can afford to overlook.

Long observation has taught him that the smooth, lighter weight pieces which you and I recognize as stamped or drawn, are usually more durable and as a rule cost him less. He doesn't care how a part was made, but he wants the toughness, the convenient streamlining, the absence of dead weight, the attractive price which are inherent in the products of the metal forming press.

If you sell metal articles or parts, this preference is important. Should conditions become more competitive, with people harder pressed for cash, it will be even more so. Now, when you're planning for possible tougher years to come, investigate up-to-date press methods applied to your problems. Consult a Clearing engineer before you take another step. There's no obligation.



CLEARING PRESSES

THE WAY TO EFFICIENT MASS PRODUCTION

CLEARING MACHINE CORPORATION

6499 WEST 65th STREET • CHICAGO 38, ILL.

HAMILTON DIVISION, HAMILTON, OHIO

powder that will bond a lubricating film on bearing surfaces and impart low friction and antiseizing properties.

Hardens Concrete Floors

USE REPLY CARD—CIRCLE No. 19

Concrete Floor Hardner No. 860, offered by Monroe Co. Inc., Cleveland 6, O., is a clear, colorless liquid that will change the chemical structure of concrete, forming a dense, nonporous, flint-like surface that retards dusting and rutting. It is applied by brush or mop and resists water, oil and acid.

¼-Inch Ball Valve

USE REPLY CARD—CIRCLE No. 20

A ¼-inch ball valve for working pressures up to 3000 psi is announced by Foxboro Co., Foxboro, Mass. Tight, positive shutoff is provided by a stainless steel ball that closes into a machined, conical seat. Ball, retained at end of the stem, is free-rolling so that every closing brings a new surface into contact with valve seat.

Automatic Programming Control

USE REPLY CARD—CIRCLE No. 21

Fireye programming control type 26RJ8, designed to provide automatic starting and programming control for commercial and industrial gas, oil and combination gas/oil burner equipment is offered by Combustion Control Corp., Cambridge, Mass. Its instantaneous response to flame failure results in complete fuel cutoff in 2 to 4 seconds.

Load Break Device

USE REPLY CARD—CIRCLE No. 22

A load break device for 100-amp open-dropout cutouts is announced by General Electric Co.'s Distribution Transformer Department, Schenectady 5, N. Y. It enables linemen to open circuits safely

USE A **REPLY CARD**

Just circle the corresponding number of any item in this section for more information.

INFORMATION

AVAILABLE FOR THE ASKING

70. Marking Machine

Jas. H. Matthews & Co.—How the model 204 general-purpose marking machine produces legible marking on round, flat and contour metal parts is explained in 4-page illustrated bulletin. Manual, semipneumatic, fully pneumatic and heavy duty models are covered.

71. Steel Conveyor Belt

May-Fran Engineering, Inc. — If your plant handles metal scrap, hot forgings, flash, wet or dry metal chips and turnings or other sharp and abrasive materials, you should be interested in the hinged steel conveyor belt described and illustrated in 4-page catalog No. MF-530. Belt can be assembled in almost any width or length from stocked components.

72. Power Squaring Shears

Niagara Machine & Tool Works—How to cut your shearing costs with air power is related in 4-page illustrated bulletin 87-A. These air-powered shears are available with nominal length cutting capacities of 3 to 10 ft in 16 and 18-gage mild steel.

73. Steam Generator

Preferred Utilities Mfg. Corp. — Here, in 28-page illustrated bulletin No. 2000, engineers, consulting engineers and architects will find guidance to understanding of design features of Preferred steam generators. Features which permit economical service for an average of 25 years are described and many construction details are covered.

74. Precision Metal Bending

O'Neil-Irwin Mfg. Co.—36-page illustrated catalog "It's Easy to Bend with Di-Acro Precision Bending Machines" gives details of wide range of manual and power benders for wire, rod, shape and strip bending machines. Step-by-step bending procedures are pictured. Also described are rod parters, brakes, notchers, punch and shear units which comprise the Dieless-Duplicating line of forming tools.

75. Structural Tubing

Nikoh Tube Co.—Minimum values such as yield point and per cent of elongation relative to welded structural tubing are tabulated on back of 4-page folder 522. Rockwell B hardness figures are given as well.

76. Motor Brush Holders

Phoenix Electric Mfg. Co.—Dimensions, specifications and other data are given on complete line of custom and standard motor brush holders in catalog 52J. Information is also presented on brush caps and assembled holders.

77. Boiler Refractories

Plibrico Jointless Firebrick Co.—"Plibrico Refractory Products for Firebox & Other Heating Boilers" is 6-page illustrated folder that covers air-cooled as well as solid refractory construction. Application of monolithic linings to firebox and other heating boilers is explained.

78. Industrial Dust Control

Pangborn Corp.—"The Control of Industrial Dust" is title of 28-page illustrated bulletin 909A which describes Pangborn dust control and its many applications. Case histories of users are documented with photographs and performance data. Specifications of equipment are given.

79. Corrosion Control

Nielco Laboratories—16-page issue of "Surfacing Conditioning Topics" offers complete information on the Nielizing corrosion control process for surface conditioning of ferrous metal, sheets, bar stock, forgings, castings and finished machined parts.

STEEL 6-23-52
Penton Building, Cleveland 13, Ohio

Please send literature or detailed information on subjects circled at left to—

NAME _____ TITLE _____

COMPANY _____

PRODUCTS MANUFACTURED _____

ADDRESS _____

CITY AND STATE _____

This card MUST be completely filled out. Please TYPE or PRINT.

1	11	21	31	41	51	61	71	81
2	12	22	32	42	52	62	72	82
3	13	23	33	43	53	63	73	83
4	14	24	34	44	54	64	74	84
5	15	25	35	45	55	65	75	85
6	16	26	36	46	56	66	76	86
7	17	27	37	47	57	67	77	87
8	18	28	38	48	58	68	78	88
9	19	29	39	49	59	69	79	89
10	20	30	40	50	60	70	80	90

FIRST CLASS
Permit No. 36
(Sec. 34.9 P.L.&R.)
CLEVELAND, OHIO

BUSINESS REPLY CARD
No Postage Stamp Necessary if Mailed in the United States

—POSTAGE WILL BE PAID BY—

STEEL
Penton Building
Cleveland 13, Ohio

Readers Service Dept.

80. Machining Attachments

Niles-Bement-Pond Co., Pratt & Whitney Div.—Two 4-page illustrated circulars, Nos. 547 and 548, present features, specifications and uses of pneumatic grinding heads and model 4A and 4B Diaform wheel forming attachment. Former operate at up to 100,000 rpm, while latter accommodates 20-in. diameter wheels for forms 3 in. wide and 1 in. deep.

81. Sand Conditioner

National Engineering Co. — Described in 6-page illustrated folder 508 are all six components that comprise the Utility sand conditioning unit. System consists of Simpson mix-muller, National bucket loader, magnetic separator, screening conveyor unit, sand hopper and aerating unit.

82. Heat Exchanger

Niagara Blower Co.—Cut-away picture of the new Aero heat exchanger is feature of 4-page illustrated bulletin 120. These units permit precise control of liquid temperatures for air conditioning, process, heat treating, lubricating, and other oil cooling, welding, heat treating and similar applications.

83. Steam, Gas & Air Turbines

Pyle-National Co.—Line of impulse type steam, gas or air turbines for mechanical drive is described in six 4 and 8-page bulletins 4110-A, B, C, D, E and F. One is devoted to each of five types ranging from ¼ to 120 hp, while all have performance charts, construction details, dimensions, weights and selection data. Sixth bulletin has general turbine information.

84. Glass Blocks

Pittsburgh Corning Corp. — Daylighting functions of each of three 12-in. light directing and light diffusing functional glass blocks and their counterparts, five 8-in. functional blocks, are detailed in 4-page folder "For New Design Flexibility." Data includes recommended elevation for each type, description and daylighting performance.

85. Fastening Method

Prestole Corp.—Policy, design data, proper tool selection, punch and die characteristics and engineering data on fastening method is described in this 8-page booklet "A Cost-Reducing Program Through Prestolizing." It is described as the art of producing a screw receiving element directly in a sheet metal unit.

86. Steam Traps

W. H. Nicholson & Co.—Industrial steam traps equipped with bronze, Monel or stainless bellows, and bodies in bronze, semisteel and cast steel construction in ¼ to 2-in. sizes and for all pressures from vacuum to 300 psi are featured in 12-page bulletin No. 152. Capacity tables and dimensions, piping diagrams, applications and selection data are included.

EDITORIAL REPRINTS:

87. Aluminum Bath Plating

Metal coats with good physical properties are produced by new type organic plating bath. Methods for depositing molybdenum, tungsten, titanium and zirconium are studied in STEEL reprint "Aluminum Electrodeposited at Room Temperature."

88. Coated Abrasives

Integration of continuous beta-ray gaging with production control on an automatic basis allows thickness and density of adhesive and abrasive to vary no more than 1 per cent in the manufacture of coated abrasives. Technique is used at Carborundum Co.'s Coated Products Div. and is described in STEEL reprint "Nuclear Gaging Controls Abrasive Coating Thickness."

89. Jet Blade Finishing

Production polishing and grinding of jet engine blades and buckets is being eased with many new machines employing coated abrasive belts. J. K. McLaughlin of the Behr-Manning Corp. talks about methods and type belts used in STEEL reprint "Coated Abrasives Ease Jet Blade Finishing Problems."

90. Blast Furnace Practice

Another informative STEEL reprint on blast furnace practice entitled, "Beneficiation of Air—XI (b)" by C. E. Agnew is available. This one concerns the control of temperature head in the lower bosh to afford the use of oxygen without disturbing temperature balance in the shaft raw material preparation operation.

BUSINESS REPLY CARD

No Postage Stamp Necessary if Mailed in the United States

—POSTAGE WILL BE PAID BY—

STEEL
Penton Building
Cleveland 13, Ohio

FIRST CLASS
Permit No. 36
(Sec. 34.9 P.L.&R.)
CLEVELAND, OHIO

Readers Service Dept.

1	11	21	31	41	51	61	71	81
2	12	22	32	42	52	62	72	82
3	13	23	33	43	53	63	73	83
4	14	24	34	44	54	64	74	84
5	15	25	35	45	55	65	75	85
6	16	26	36	46	56	66	76	86
7	17	27	37	47	57	67	77	87
8	18	28	38	48	58	68	78	88
9	19	29	39	49	59	69	79	89
10	20	30	40	50	60	70	80	90

STEEL
Penton Building, Cleveland 13, Ohio

6-23-52

Please send literature or detailed information on subjects circled at left to—

NAME _____ TITLE _____

COMPANY _____

PRODUCTS MANUFACTURED _____

ADDRESS _____

CITY AND STATE _____

This card MUST be completely filled out. Please TYPE or PRINT.

under load, to sectionalize, isolate lines and to switch capacitor banks and other equipment. It permits mechanical tension and resulting mechanical breakage at fusible element of fuse link.

Snap-Action Switch

USE REPLY CARD—CIRCLE No. 23

Micro Switch, division of Minneapolis - Honeywell Regulator Co., Freeport, Ill., introduces a snap-action switch designed for high-precision performance in cam actuated service. It has the capacity to make or break steady state currents of 20 amp and to handle in-rush currents as high as 75 amp.

Setup Accessories

USE REPLY CARD—CIRCLE No. 24

J. H. Williams & Co., Buffalo 7, N. Y., has added T-slot bolts, nuts and flat washers, T-slot nuts and setup wedges to its line of setup accessories. Bolts are available in 3/8, 1/2, 5/8, 3/4, 7/8 and 1-inch T-slot sizes in a wide range of lengths.

Thread-Cutting Screws

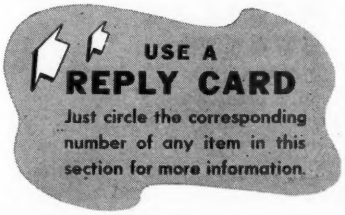
USE REPLY CARD—CIRCLE No. 25

Type 25 thread-cutting screw, made by Shakeproof Inc., Elgin, Ill., features a combination pancake-hexagon head for molding into rubber. In application, rubber is molded around the screw head; enlarged pancake surface provides holding power and hexagon feature prevents screw from turning.

Resistors for High Current Use

USE REPLY CARD—CIRCLE No. 26

Powr-Rib, an edgewound type resistor for high current duty in both intermittent and continuous applications is announced by Ohmite Mfg. Co., Chicago, Ill. It is applicable in electric trucks, battery chargers, motor controllers, load banks, plating and welding equipment.



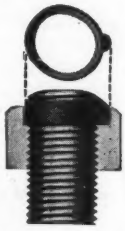
THERE IS NO OTHER FASTENER LIKE THIS!

IF YOU are one of those people who believes a cotter pin is the only way to hold anything positively on a shaft you will be surprised at tests made on Security Locknuts. Authoritative tests have proved Security Locknuts practically vibration proof.

Security Locknuts stay "put" where you wrench them even in the face of vibration that destroys the bolt. They permit accurate adjustments with a torque wrench. They are complete as a unit. There is nothing to line up. Installation involves only one operation and there are no holes to weaken the bolt or stud.

Security Nuts can be adjusted and re-adjusted any number of times but more important, they can be *removed and re-used over and over again without materially losing their locking power and without damage to the bolt.* We'd like to have you see the results of these tests. If you have a vibration or fastener problem, Security Locknuts are a dependable solution and may save you money over methods you are now using.

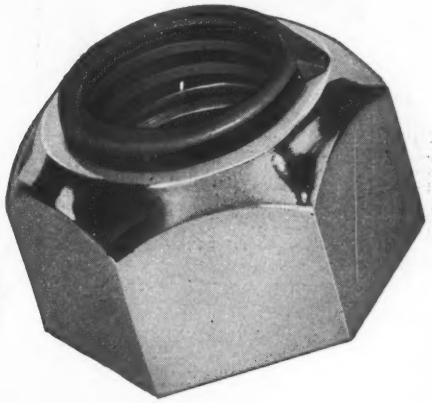
Security Locknuts are made in 3/8 in. to 3 in. bolt sizes. Ask to see the Security Locknut Tests.



The picture above shows a cross-section of a Security Locknut. The insert, indicated removed, is of high quality heat treated, alloy spring steel and becomes a permanent part of the nut.

The insert is elliptical in shape and this design causes the retainer to grip the bolt with the terrific tension that only spring steel of great strength could exert and prevent the nut from turning. Simple—dependable — positive!

SECURITY LOCKNUT CORPORATION
North Ave. and 15th Ave., Melrose Park, Ill.



Security
The Nut You Can't Shake Loose

SPECIAL OFFER! Here's an easy way to arrive at thread tolerance figures. Ask for a Security Thread Tolerance Chart. Just spin the dial and you have the figure you need. Send the coupon. It's yours for the asking.

SECURITY LOCKNUT CORPORATION
North Ave. and 15th Ave., Melrose Park, Ill.
Please send me without obligation:
☐ One of your Thread Tolerance Charts.
☐ We have a fastener problem and would like to know more about Security Locknuts.

Company Name .....
Address .....
Town ..... Zone ..... State .....
Signed .....

All these...and More

American PHILLIPS Wood Screws with sharp gimlet points, sharp threads, well-formed heads.

American PHILLIPS "TWINfast" Wood Screws with twin threads for greater driving speed.

American PHILLIPS Type 23 Thread-Cutting Screws, for metals.

American PHILLIPS Type 25 Thread-Cutting Screws, for plastics.

American PHILLIPS Sems* Assemblies, pre-assembled lock washers and screws save assembly time.

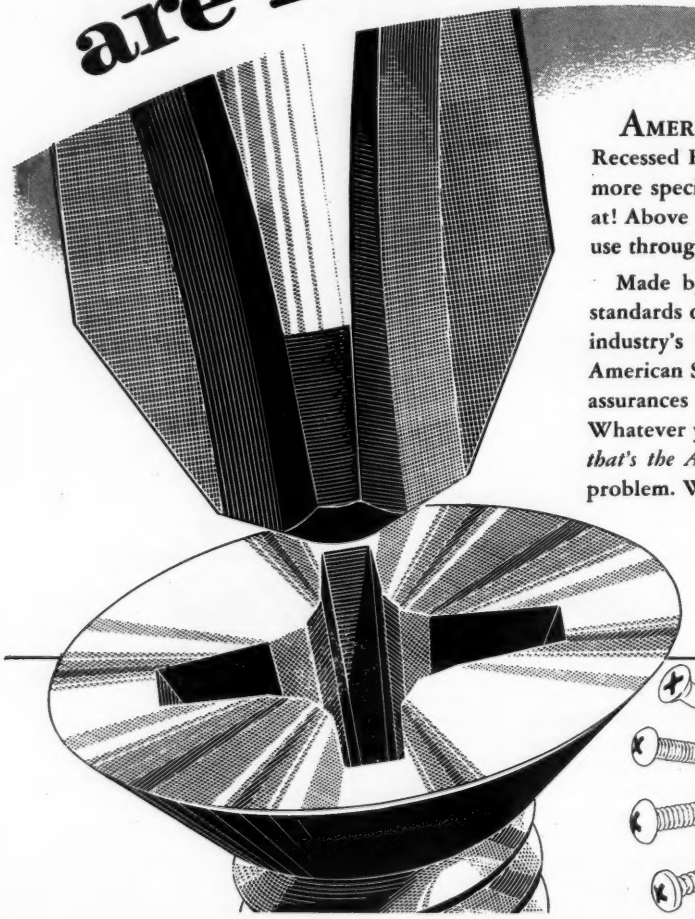
*(U. S. PATENTS NO. 2,113,424 AND 2,113,425.)

American PHILLIPS Type A Tapping Screws, for faster fastening of light-gage sheet metal.

American PHILLIPS Type B Tapping Screws, for assembling heavy sheet metal.

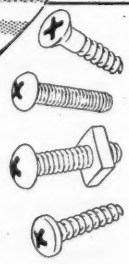
American PHILLIPS Machine Screws for fastest driving in drilled or tapped holes (or with nuts).

are AMERICAN



AMERICAN makes all types of standard Phillips Recessed Head Screws (slotted screws, too)... and more special types than you can shake a blueprint at! Above are shown some of the types in widest use throughout industry today.

Made by American craftsmen, under American standards of quality control... in one of the screw industry's most modern high-production plants, American Screws and Bolts are one of the stoutest assurances of quality control *for your own product.* Whatever you need to fasten, in the fastest way... *that's the American way.* Let's have a look at *your* problem. Write.

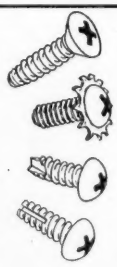


AMERICAN SCREW COMPANY

PHILLIPS HEADquarters

WILLIMANTIC, CONNECTICUT

Main Office & Plant
Willimantic, Conn.
Office & Plant, Norristown, Pa.
Office & Warehouse, Chicago, Ill.



The Market Outlook

THE METALWORKING INDUSTRY today had enough steel to run at least two weeks without a slackening of pace. That would take the industry up to the Fourth of July when mass vacations of a week to two weeks will defer the full impact of the steel strike.

There are, as may be expected, some exceptions to the over-all pattern: Some steel users already have found it necessary to begin production curtailments.

Some metalworking plants will suspend operations before all of their steel supplies are exhausted, so they can resume production at about the time steel begins pouring in volume again from the mills.

VULNERABLE—Defense work will be hit harder and sooner than civilian production in some cases, even though direct defense output is only a small segment of all industrial production and is of high priority. The reason: Most of the steel required for defense work never has been off the short list. Two automobile manufacturers holding defense contracts are near the shutdown point on rocket manufacture because of lack of seamless tubing. This product has been in particularly stringent supply because tube rounds from which seamless tubing is made must come from bar mills. And bar mills haven't been able to keep up with demand.

SUPER PRIORITY—When steel production is resumed, it will take a week to get mill operations up to capacity. If by that time consumers' steel stocks have been exhausted don't be surprised if for a while there is a super priority on steel for defense production. This would delay the replenishment of steel stocks for civilian goods manufacture. That means the real shortage of steel for some is yet to come.

Already, priorities have been given to spread the available steel to defense work. One instance is the ban on shipments of steel from warehouses for use in consumer durable goods. Another is the ban on shipments of aircraft quality alloy steel from warehouses to any customer who has received 2½ tons a month of this product from all sources.

EMERGENCY ACTION—As a further aid to the defense program, government officials were shaping up plans to move finished steel from struck mills and warehouses and to get some of the mills back into production so that 250,000 tons more of finished steel a month could be made available for defense needs.

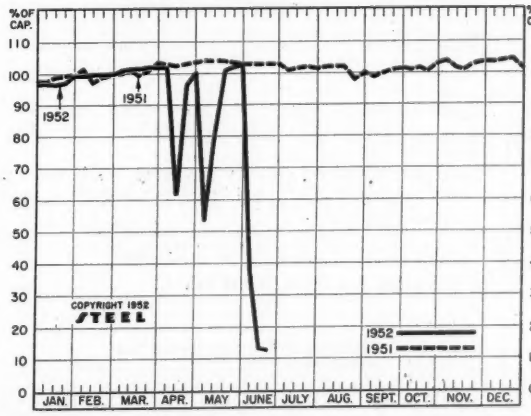
Carryover of orders from the strike-ridden second quarter into the third quarter will make it impossible to cash all third-quarter NPA tickets for steel in the third quarter. NPA considers the calling back of tickets an impossible job. Therefore, uncashed third-quarter tickets will be carried over into the fourth quarter.

FORWARD PLANNING—While most steel consumers have taken the steel strike in stride and have made no frantic efforts to procure tonnage, there are some signs of forward planning. Automotive interests were reported seeking conversion steel; some consumers were inquiring more actively for tonnage from mills still in operation, although they were moving slowly in paying high premiums; importers of foreign steel report a pickup in inquiries for plate and some alloy steels; consumers who had not ordered heavily for third-quarter delivery are showing increasing concern over the fourth quarter.

Third week of the steel strike saw the small amount of existing production ease off one-half of a percentage point. This put STEEL's ingot production rate for the week ended June 21 at 12.5 per cent of capacity. This is equivalent to 260,000 net tons.

STRIKE LOSSES—Loss through today from the three steel work stoppages this year is approximately 7.8 million tons. Since the end of World War II, the loss of steel in the United States from major strikes totals approximately 36.6 million tons. This loss is only from large scale walkouts by steel workers and coal miners. It does not include losses during numerous wildcat strikes. Largest annual loss was 13.5 million tons in 1946.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

Percentage of Capacity Engaged at Leading Production Points

	Week Ended June 21	Change	Same Week 1951	Same Week 1950
Pittsburgh	2	0	101	101
Chicago	7.5	0*	104.5	103
Mid-Atlantic	19	0	102	98
Youngstown	0	0	105	106
Wheeling	51.5	0	98.5	102.5
Cleveland	0	0	102	100
Buffalo	0	0	104	104
Birmingham	0.5	0	100	100
New England	23	— 2	85	92
Cincinnati	58.5	0*	100	106
St. Louis	30	— 8.5	92	99
Detroit	35	+ 3	99	111
Western	33	0*	102	96
Estimated national rate	12.5	— 0.5	103	101

Based on weekly steelmaking capacity of 2,077,040 tons in 1952; 1,999,034 tons for 1951; 1,928,721 tons for second half, 1950; 1,906,268 tons for first half, 1950.

* Change from revised rate for preceding week.

The Metalworking Outlook—p. 35 Production-Engineering News—p. 71

Composite Market Averages

	June 19 1952	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
FINISHED STEEL INDEX, Weighted:					
Index (1935-39 av.=100) ..	171.92†	171.92†	171.92†	171.92	118.67
Index in cents per lb.	4.657†	4.657†	4.657†	4.657	3.215
ARITHMETICAL PRICE COMPOSITES:					
Finished Steel, NT	$106.32†	$106.32†	$106.32†	$106.32	$69.82
No. 2 Fdry, Pig Iron, GT..	52.54	52.54	52.54	52.54	32.99
Basic Pig Iron, GT	52.16	52.16	52.16	52.16	32.49
Malleable Pig Iron, GT ...	53.27	53.27	53.27	53.27	33.71
Steelmaking Scrap, GT	43.00	43.00	43.00	44.00	33.50

Weighted finished steel index based on average shipments and Pittsburgh district prices of the following 14 representative products during 5-year base period 1935-39: Structural shapes, plates, rails, hot-rolled and cold-finished bars, pipe, wire, nails, tin plate, hot and cold-rolled sheets, galvanized sheets, hot and cold-rolled strip. For complete explanation see STEEL Sept. 19, 1949, p. 54.

Arithmetical steel price composite based on same products as the weighted finished steel index with the exception of rails, cold-finished bars, galvanized sheets and hot-rolled strip.

Basic and No. 2 foundry pig iron composites are base on average prices at Pittsburgh, Bethlehem, Birmingham, Buffalo, Chicago, Cleveland, Granite City, Youngstown. Malleable composite based on same points except Birmingham.

Steelmaking scrap composite based on average prices of No. 1 heavy melting steel at Pittsburgh, Chicago and Philadelphia.

† Preliminary, pending 1952 tin plate contract price announcement.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED MATERIALS

	June 19 1952	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh	3.70	3.70	3.70	3.70	2.60
Bars, H.R., Chicago	3.70	3.70	3.70	3.70	2.60
Bars, H.R., del. Philadelphia	4.252	4.252	4.252	4.20	2.98
Bars, C.F., Pittsburgh	4.55	4.55	4.55	4.55	3.20
Shapes, Std., Pittsburgh ..	3.65	3.65	3.65	3.65	2.50
Shapes, Std., Chicago	3.65	3.65	3.65	3.65	2.50
Shapes, del. Philadelphia ..	3.93·	3.93	3.93	3.91	2.64
Plates, Pittsburgh	3.70	3.70	3.70	3.70	2.65
Plates, Chicago	3.70	3.70	3.70	3.70	2.65
Plates, Coatesville, Pa. ...	4.15	4.15	4.15	4.15	2.80
Plates, Sparrows Point, Md.	3.70	3.70	3.70	3.70	2.65
Plates, Claymont, Del.	4.15	4.15	4.15	4.15	2.80
Sheets, H.R., Pittsburgh ..	3.60–75	3.60–75	3.60–75	3.60–75	2.50
Sheets, H.R., Chicago	3.60	3.60	3.60	3.60	2.50
Sheets, C.R., Pittsburgh ..	4.35	4.35	4.35	4.35	3.20
Sheets, C.R., Chicago	4.35	4.35	4.35	4.35	3.20
Sheets, C.R., Detroit	4.55	4.55	4.55	4.55	3.35
Sheets, Galv., Pittsburgh ..	4.80	4.80	4.80	4.80	3.55
Strip, H.R., Pittsburgh ...	3.75-4.00	3.75-4.00	3.75-4.00	3.75-4.00	2.50
Strip, H.R., Chicago	3.50	3.50	3.50	3.50	2.50
Strip, C.R., Pittsburgh	4.65-5.35	4.65-5.35	4.65-5.35	4.65-5.35	3.20
Strip, C.R., Chicago	4.90	4.90	4.90	4.90	3.30
Strip, C.R., Detroit	4.85-5.60	4.85-5.60	4.85-5.60	4.35-5.60	3.35
Wire, Basic, Pittsburgh ...	4.85-5.10	4.85-5.10	4.85-5.10	4.85-5.10	3.425
Nails, Wire, Pittsburgh ...	5.90-6.20	5.90-6.20	5.90-6.20	5.90-6.20	4.125
Tin plate box, Pittsburgh..	$8.70	$8.70	$8.70	$8.70	$5.75

SEMIFINISHED

Billets, forging, Pitts. (NT)	$66.00	$66.00	$66.00	$66.00	$50.00
Wire rods, ½"-⅝", Pitts. ..	4.10–30	4.10–30	4.10–30	4.10–30	2.55

PIG IRON, Gross Ton

Bessemer, Pitts.	$53.00	$53.00	$53.00	$53.00	$34.00
Basic, Valley	52.00	52.00	52.00	52.00	33.00
Basic, del. Phila.	56.75	56.75	56.75	56.49	35.52
No. 2 Fdry. Pitts.	52.50	52.50	52.50	52.50	33.50
No. 2 Fdry, Chicago	52.50	52.50	52.50	52.50	33.00
No. 2 Fdry, Valley	52.50	52.50	52.50	52.50	33.50
No. 2 Fdry, del. Phila. ...	57.25	57.25	57.25	56.99	36.02
No. 2 Fdry, Birm.	48.88	48.88	48.88	48.88	29.88
No. 2 Fdry (Birm.) del. Cin.	55.49	55.49	55.49	55.33	34.75
Malleable, Valley	52.50	52.50	52.50	52.50	33.50
Malleable, Chicago	52.50	52.50	52.50	52.50	33.50
Charcoal, Lyles, Tenn.	66.00	66.00	66.00	66.00	40.50
Ferromanganese, Etna, Pa.	188.00	188.00	188.00	188.00	140.25*

* F.o.b. cars, Pittsburgh.

SCRAP, Gross Ton (including broker's commission)

No. 1 Heavy Melt, Pitts...	$44.00	$44.00	$44.00	$45.00	$32.50
No. 1 Heavy Melt, E. Pa...	42.50	42.50	42.50	43.50	36.75
No. 1 Heavy Melt, Chicago.	42.50	42.50	42.50	43.50	31.25
No. 1 Heavy Melt, Valley..	44.00	44.00	44.00	45.00	35.00
No. 1 Heavy Melt, Cleve...	43.00	43.00	43.00	44.00	32.50
No. 1 Heavy Melt, Buffalo.	43.00	43.00	43.00	44.00	31.50
Rails, Rerolling, Chicago...	52.50	52.50	52.50	52.50	36.50
No. 1 Cast, Chicago	45.00	45.00	47.00	49.00*	39.00

* F.o.b. shipping point.

COKE, Net Ton

Beehive, Furn, Connlsvl. ..	$14.75	$14.75	$14.75	$14.75	$8.75–9.50
Beehive, Fdry, Connlsvl. ...	17.50	17.50	17.50	17.50	9.75–11.50
Oven Fdry, Chicago	23.00	23.00	23.00	21.00	15.10

NONFERROUS METALS

Copper, del. Conn.	24.50	24.50	24.50	24.50	21.50
Zinc, E. St. Louis.....	15.00	16.00	19.50	17.50	10.50
Lead, St. Louis	14.80	14.80	14.80	16.80	14.80-14.85
Tin, New York	121.50	121.50	121.50	106.00	80.00
Aluminum, del.	19.00	19.00	19.00	19.00	15.00
Antimony, Laredo, Tex. ..	39.00	39.00	39.00	42.00	33.00
Nickel, refinery, duty paid.	56.50	56.50	56.50	56.50	35.00

PIG IRON

F.o.b. furnace prices quoted under GCPR as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax. Key to producing companies published on second following page.

PIG IRON, Gross Ton

	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem, Pa. B2	$54.00	$54.50	$55.00	$55.50
NewYork, del.	....	58.28	58.78	....
Newark, del.	57.02	57.52	58.02	58.52
Philadelphia, del.	56.75	57.25	57.75	58.25
Birmingham District				
Alabama City, Ala. R2	48.38	48.88	....	....
Birmingham R2	48.38	48.88	....	....
Birmingham S9	48.38	48.88	....	....
Woodward, Ala. W15	48.38	48.88	....	....
Cincinnati, del.	....	55.49	....	....
Buffalo District				
Buffalo R2	52.00	52.50	53.00	....
Buffalo H1	52.00	52.50	53.00	....
Tonawanda, N.Y. W12	52.00	52.50	53.00	....
No. Tonawanda, N.Y. T9	....	52.50	53.00	....
Boston, del.	62.11	62.61	63.11	....
Rochester, N.Y., del.	54.88	55.38	55.88	....
Syracuse, N.Y., del.	55.91	56.41	56.91	....
Chicago District				
Chicago I-3	52.00	52.50	52.50	53.00
Gary, Ind. U5	52.00	....	52.50	....
IndianaHarbor, Ind. I-2	52.00	....	52.50	....
So. Chicago, Ill. W14	52.00	52.50	52.50	....
So. Chicago, Ill. Y1	52.00	52.50	52.50	....
So. Chicago, Ill. U5	52.00	....	52.50	53.00
Milwaukee, del.	54.06	54.56	54.56	55.06
Muskegon, Mich., del.	....	58.47	58.47	....
Cleveland District				
Cleveland A7	52.00	52.50	52.50	53.00
Cleveland R2	52.00	52.50	52.50	....
Akron, O., del. from Cleve.	54.61	55.11	55.11	55.61
Lorain, O. N3	52.00	....	....	53.00
Duluth I-3	....	....	52.50	....
Erie, Pa. I-3	52.00	52.50	52.50	53.00
Everett, Mass. E1	....	59.75	60.25	....
Fontana, Calif. K1	58.00	58.50	....	....
Seattle, Tacoma, Wash., del.	....	60.66	....	....
Portland, Oreg., del.	....	60.66	....	....
LosAngeles, SanFrancisco, del. ...	60.16	60.66	....	....
GraniteCity, Ill. G4	53.90	54.40	54.90	....
St. Louis, del. (inc. tax).....	54.66	55.16	55.66	....
Ironton, Utah C11	52.00	52.50	....	....
Geneva, Utah C11	52.00	52.50	....	....
LoneStar, Tex. L6	48.00	*48.50	48.50	....
Minnequa, Colo. C10	54.00	55.00	55.00	....
Pittsburgh District				
NevilleIsland, Pa. P6	....	52.50	52.50	53.00
Pitts., N.&S. sides, Ambridge, Aliquippa, del.	....	53.80	53.80	54.30
McKeesRocks, del.	....	53.54	53.54	54.04
Lawrenceville, Homestead, McKeesport, Monaca, del.	....	54.07	54.07	54.57
Verona, del.	....	54.57	54.57	55.07
Brackenridge, del.	....	54.82	54.82	55.32
Bessemer, Pa. U5	52.00	....	52.50	53.00
Clairton, Rankin, So. Duquesne, Pa. U5	52.00	....	....	....
McKeesport, Pa. N3	52.00	....	....	53.00
Monessen, Pa. P7	54.00	....	....	....
Sharpsville, Pa. S6	....	....	52.50	53.00
Steelton, Pa. B2	54.00	54.50	55.00	55.50
Swedeland, Pa. A3	56.00	56.50	57.00	57.50
Toledo, O. I-3	52.00	52.50	52.50	53.00
Cincinnati, del.	57.47	57.97	....	....
Troy, N.Y. R2	54.00	54.50	55.00	55.50
Youngstown District				
Hubbard, O. Y1	52.00	52.50	52.50	....
Youngstown Y1	52.00	52.50	52.50	....
Youngstown U5	52.00	....	....	53.00
Mansfield, O., del.	56.65	57.15	57.15	57.65

* Low phos, southern grade.

PIG IRON DIFFERENTIAL

Silicon: Add 50 cents per ton for each 0.25% Si over base grade, 1.75-2.25%, except on low phos iron on which base is 1.75-2.00%.

Phosphorus: Deduct 38 cents per ton for P content of 0.70% and over.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1% or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, incl., add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.0-6.50% silicon; add $1.50 for each 0.5% Si)

Jackson, O. G2, J1	$62.50
Buffalo H1	63.75

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon: add $1 for each 0.5% Si to 18%; $1 for each 0.5% Mn over 1%; $1 for each 0.045% max. P)

NiagaraFalls, N.Y. P15	$88.00
Keokuk, Iowa, Openhearth & Fdry, frt. allowed K2	92.50
Keokuk, OH & Fdry., 12½ lb piglets, 16% Si, frt. allowed K2	95.50
Wenatchee, Wash., OH & Fdry., frt. allowed K2	92.50

CHARCOAL PIG IRON, Gross Ton

(Low phos semi-coke blast; differential charged for silicon over base grade; also for hard chilling iron Nos. 5 & 6)

Lyles, Tenn. T3	$66.00

LOW PHOSPHORUS PIG IRON, Gross Ton

Cleveland, intermediate, A7	$57.00
Steelton, Pa. B2	60.00
Philadelphia delivered	63.55
Troy, N.Y. R2	60.00

(Material in this department is protected by copyright and its use in any form without permission is prohibited)

Semifinished and Finished Steel Products

Mill prices quoted under GCPR as reported to STEEL, June 19, 1952; cents per pound except as otherwise noted. Changes shown in italics. Code numbers following mill points indicate producing company; key on next two pages.

INGOTS, Carbon, Forging (NT)
Fontana,Calif. K1 ..$79.00
Munhall,Pa. U5 .....52.00
Seattle S24 .....73.00

INGOTS, Alloy (NT)
Detroit R7 .....$54.00
Fontana,Calif. K1 ....80.00
Houston S5 .....62.00
Midland,Pa. C18 .....54.00
Munhall,Pa. U5 .....54.00

BILLETS, BLOOMS & SLABS
Carbon, Rerolling (NT)
Bessemer,Pa. U5 ...$56.00
Clairton,Pa. U5 .....56.00
Ensley,Ala. T2 .....56.00
Fairfield,Ala. T2 ....56.00
Fontana,Calif. K1 ...75.00
Gary,Ind. U5 .....56.00
Johnstown,Pa. B2 ....56.00
Lackawanna,N.Y. B2..56.00
Munhall,Pa. U5 .....56.00
So.Chicago,Ill. U5 ...56.00
So.Duquesne,Pa. U5 ..56.00

Carbon, Forging (NT)
Bessemer,Pa. U5 ....$66.00
Buffalo R2 .....66.00
Canton,O. R2 .....66.00
Clairton,Pa. U5 .....66.00
Cleveland R2 .....66.00
Conshohocken,Pa. A3..73.00
Detroit R7 .....69.00
Ensley,Ala. T2 .....66.00
Fairfield,Ala. T2 ....66.00
Fontana,Calif. K1 ...85.00
Gary,Ind. U5 .....66.00
Geneva,Utah C11 ....66.00
Houston S5 .....74.00
Johnstown,Pa. B2 ...66.00
Lackawanna,N.Y. B2..66.00
LosAngeles B3 .....85.00
Munhall,Pa. U5 .....66.00
Seattle B3 .....85.00
So.Chicago R2,U5,W14.66.00
So.Duquesne,Pa. U5 ..66.00
So.SanFrancisco B3 ..85.00

Alloy, Forging (NT)
Bethlehem,Pa. B2 ...$70.00
Buffalo R2 .....70.00
Canton,O. R2 .....70.00
Canton,O.(29) T7 ...66.00
Conshohocken,Pa. A3..77.00
Detroit R7 .....73.00
Fontana,Calif. K1 ....89.00
Gary,Ind. U5 .....70.00
Houston S5 .....78.00
Ind.Harbor,Ind. Y1 ...70.00
Johnstown,Pa. B2 ....70.00
Lackawanna,N.Y. B2..70.00
LosAngeles B3 .....90.00
Massillon,O. R2 .....70.00
Midland,Pa. C18 .....70.00
Munhall,Pa. U5 .....70.00
So.Chicago R2,U5,W14.70.00
So.Duquesne,Pa. U5 ..70.00
Struthers,O. Y1 .....70.00
Warren,O. C17 .....70.00

ROUNDS, SEAMLESS TUBE (NT)
Canton,O. R2 .....$82.00
Cleveland R2 .....82.00
Fontana,Calif. K1 ...103.00
Gary,Ind. U5 .....82.00
Massillon,O. R2 .....82.00
So.Chicago,Ill. R2 ...82.00
So.Duquesne,Pa. U5 ..82.00

SHEET BARS (NT)
Fontana,Calif. K1 ...$89.00

SKELP
Aliquippa,Pa. J5 ....$3.45
Munhall,Pa. U5 .....3.35
Warren,O. R2 .....3.35
Youngstown R2, U5 ..3.35

WIRE RODS
Alton,Ill. L1 .....4.40
AlabamaCity,Ala. R2 ..4.10
Buffalo W12 .....4.10
Cleveland A7 .....4.10
Donora,Pa. A7 .....4.10
Fairfield,Ala. T2 .....4.10
Fontana,Calif. K1 ....4.90
Houston S5 .....4.50
Johnstown,Pa. B2 ....4.10
Joliet,Ill. A7 .....4.10
LosAngeles B3 .....4.90
Minnequa,Colo. C10 ...4.35
Monessen,Pa. P7 .....4.30
No.Tonawanda,N.Y. B11.4.10
Pittsburg,Calif. C11 ....4.75
Portsmouth,O. P12 ....4.30
Roebling,N.J. R5 .....4.20
So.Chicago,Ill. R2 ....4.10
SparrowsPoint,Md. B2..4.20
Sterling,Ill.(1) N15 ...4.10
Struthers,O. Y1 .....4.10
Torrance,Calif. C11 ....4.90
Worcester,Mass. A7 ....4.40

SHEET STEEL PILING
Ind.Harbor,Ind. I-2 ....4.45
Lackawanna,N.Y. B2 ..4.45
Munhall,Pa. U5 .....4.15
So.Chicago,Ill. U5 ....4.45

STRUCTURALS
Carbon Steel Stand. Shapes
AlabamaCity,Ala. R2 ..3.60
Aliquippa,Pa. J5 .....3.65
Bessemer,Ala. T2 .....3.65
Bethlehem,Pa. B2 ....3.70
Clairton,Pa. U5 .....3.65
Fairfield,Ala. T2 .....3.65
Fontana,Calif. K1 ....4.25
Gary,Ind. U5 .....3.65
Geneva,Utah C11 .....3.65
Houston S5 .....4.05
Ind.Harbor,Ind. I-2 ...3.65
Johnstown,Pa. B2 ....3.70
KansasCity,Mo. S5 ...4.25
Lackawanna,N.Y. B2 ..3.70
LosAngeles B3 .....4.25
Minnequa,Colo. C10 ...4.10
Munhall,Pa. U5 .....3.65
Niles,Calif.(22) P1 ....4.85
Phoenixville,Pa. P4 ....5.90
Portland,Oreg. O4 .....4.50
Seattle B3 .....4.30
So.Chicago,Ill. U5 W14.3.65
So.SanFrancisco B3 ...4.20
Torrance,Calif. C11 ....4.25
Weirton,W.Va. W6 ....3.90

Alloy Stand. Shapes
Clairton,Pa. U5 .....4.35
Fontana,Calif. K1 .....5.55
Munhall,Pa. U5 .....4.35
So.Chicago,Ill. U5 .....4.35

H.S., L.A. Stand. Shapes
Aliquippa,Pa. J5 .....5.50
Bessemer,Ala. T2 .....5.50
Bethlehem,Pa.(14) B2 .5.50
Clairton,Pa. U5 .....5.50
Fairfield,Ala. T2 .....5.50
Fontana,Calif. K1 .....6.10
Gary,Ind. U5 .....5.50
Geneva,Utah C11 .....5.50
Ind.Harbor,Ind. I-2 ...5.50
Ind.Harbor,Ind. Y1 ....6.00
Johnstown,Pa. B2 .....5.50
Lackawanna,N.Y.(14)B2 5.50
LosAngeles B3 .....6.05
Munhall,Pa. U5 .....5.50
Seattle B3 .....6.10
So.Chicago,Ill. U5 ....5.50
So.SanFrancisco B3 ....6.00
Struthers,O. Y1 .....6.00

Wide Flange
Bethlehem,Pa. B2 ....3.70
Clairton,Pa. U5 .....3.65
Fontana,Calif. K1 .....4.65
Lackawanna,N.Y. B2 ..3.70
Munhall,Pa. U5 .....3.65
So.Chicago,Ill. U5 .....3.65

H.S., LA. Wide Flange
Aliquippa,Pa. J5 .....5.50
Lackawanna,N.Y. B2 ..5.50
Munhall,Pa. U5 .....5.45
So.Chicago,Ill. U5 .....5.45

BEARING PILES
Munhall,Pa. U5 .....3.65
So.Chicago,Ill. U5 .....3.65

PLATES,High-Strength Low-Alloy
Aliquippa,Pa. J5 .....5.65
Bessemer,Ala. T2 .....5.65
Clairton,Pa. U5 .....5.65
Cleveland J5, R2 .....5.65
Conshohocken,Pa. A3 ..5.90
Fairfield,Ala. T2 .....5.65
Fontana,Calif.(30) K1 ..6.25
Gary,Ind. U5 .....5.65
Geneva,Utah C11 .....5.65
Ind.Harbor,Ind. I-2 ...5.65
Ind.Harbor,Ind. Y1 ....6.15
Johnstown,Pa. B2 .....5.65
Munhall,Pa. U5 .....5.65
Pittsburgh J5 .....5.65
Seattle B3 .....6.55
Sharon,Pa. S3 .....5.70
So.Chicago,Ill. U5 .....5.65
SparrowsPoint,Md. B2 .5.65
Warren,O. R2 .....5.65
Youngstown Y1 .....6.15

PLATES, Open-Hearth Alloy
Claymont,Del. C22 ....4.85
Coatesville,Pa. L7 ....5.25
Conshohocken,Pa. A3 ..5.05
Fontana,Calif. K1 ....5.70
Gary,Ind. U5 .....4.75
Johnstown,Pa. B2 .....4.75
Munhall,Pa. U5 .....4.75
Sharon,Pa. S3 .....5.20
So.Chicago,Ill. U5 .....4.75
SparrowsPoint,Md. B2 .4.75

FLOOR PLATES
Cleveland J5 .....4.75
Conshohocken,Pa. A3 ..4.75
Ind.Harbor,Ind. I-2 ...4.75
Munhall,Pa. U5 .....4.75
So.Chicago,Ill. U5 .....4.75

PLATES, Ingot Iron
Ashland,c.l. (15) A10 ..3.95
Ashland,l.c.l. (15) A10..4.45
Cleveland,c.l. R2 .....4.30
Warren,O.c.l. R2 .....4.30

PLATES, Carbon Steel
AlabamaCity,Ala. R2 ..3.70
Aliquippa,Pa. J5 .....3.70
Ashland,Ky. (15) A10 ..3.70
Bessemer,Ala. T2 .....3.70
Clairton,Pa. U5 .....3.70
Claymont,Del. C22 .....4.15
Cleveland J5, R2 .....3.70
Coatesville,Pa. L7 .....4.15
Conshohocken,Pa. A3 ..4.15
Fairfield,Ala. T2 .....3.70
Fontana,Calif.(30) K1 ..4.30
Gary,Ind. U5 .....3.70
GraniteCity,Ill. G4 .....4.40
Geneva,Utah C11 .....3.70
Harrisburg,Pa. C5 .....6.30
Houston S5 .....4.10
Ind.Harbor,Ind. I-2, Y1.3.70
Johnstown,Pa. B2 .....3.70
Lackawanna,N.Y. B2 ..3.70
Minnequa,Colo. C10 ....4.50
Munhall,Pa. U5 .....3.70
Pittsburgh J5 .....3.70
Seattle B3 .....4.60
Sharon,Pa. S3 .....3.95
So.Chicago,Ill. U5 W14..3.70
SparrowsPoint,Md. B2 ..3.70
Steubenville,O. W10 ....3.70
Warren,O. R2 .....3.70
Weirton,W.Va. W6 ....4.00
Youngstown R2, U5, Y1.3.70

PLATES, Carbon A.R.
Fontana,Calif. K1 .....5.45
Geneva,Utah C11 .....4.85

PLATES, Wrought Iron
Economy,Pa. B14 .....8.60

BARS, Hot-Rolled Carbon
AlabamaCity,Ala. R2 ..3.70
Aliquippa,Pa. J5 .....3.70
Alton,Ill. L1 .....4.15
Atlanta,Ga. A11 .....4.25
Bessemer,Ala. T2 .....3.70
Buffalo R2 .....3.70
Canton,O. R2 .....3.70
Clairton,Pa. U5 .....3.70
Cleveland R2 .....3.70
Detroit R7 .....3.85
Emeryville,Calif. J7 ....4.45
Fairfield,Ala. T2 .....3.70
Fontana,Calif. K1 .....4.40
Gary,Ind. U5 .....3.70
Houston S5 .....4.10
Ind.Harbor,Ind. I-2, Y1.3.70
Johnstown,Pa. B2 .....3.70
KansasCity,Mo. S5 ....4.30
Lackawanna,N.Y. B2 ..3.70
Los Angeles B3 .....4.40
Milton,Pa. B6 .....4.55
Minnequa,Colo, C10 ....4.15
Niles,Calif. P1 .....5.05
N.Tonawanda,N.Y. B11..3.70
Pittsburg,Calif. C11 ....4.40
Pittsburgh J5 .....3.70
Portland,Oreg. O4 .....4.65
Seattle B3, N14 .....4.45
So.Chicago R2, U5, W14.3.70
So.Duquesne,Pa. U5 ....3.70
So.SanFran.,Cal. B3 ....4.45
Struthers,O. Y1 .....3.70
Torrance,Calif. C11 ....4.40
Weirton,W.Va. W6 .....3.85
Youngstown R2, U5 ....3.70

BAR SIZE ANGLES; S. Shapes
Aliquippa,Pa. J5 .....3.70
Atlanta A11 .....4.25
Johnstown,Pa. B2 .....3.70
Lackawanna,N.Y. B2 ..3.70
Niles,Calif. P1 .....5.05
Portland,Oreg. O4 .....4.65
SanFrancisco S7 .....4.85

BAR SIZE ANGLES; H.R.CARBON
Bethlehem,Pa. B2 .....3.90

BARS, Hot-Rolled Alloy
Bethlehem,Pa. B2 .....4.30
Buffalo R2 .....4.30
Canton,O. R2 .....4.30
Canton,O.(29) T7 .....3.95
Clairton,Pa. U5 .....4.30
Detroit R7 .....4.45
Ecorse,Mich. G5 .....4.65
Fontana,Calif. K1 .....5.35
Gary,Ind. U5 .....4.30
Houston S5 .....4.70
Ind.Harbor,Ind. I-2, Y1.4.30
Johnstown,Pa. B2 .....4.30
KansasCity, Mo. S5 ....4.90
Lackawanna,N.Y. B2 ..4.30
LosAngeles B3 .....5.35
Massillon,O. R2 .....4.30
Midland,Pa. C18 .....4.30
So.Chicago R2, U5, W14.4.30
So.Duquesne,Pa. U5 ....4.30
Struthers,O. Y1 .....4.30
Warren,O. C17 .....4.30
Youngstown U5 .....4.30

BAR SHAPES, Hot-Rolled Alloy
Clairton,Pa. U5 .....4.55
Gary,Ind. U5 .....4.55
Youngstown U5 .....4.55

BARS & SMALL SHAPES, H.R., High-Strength Low-Alloy
Aliquippa,Pa. J5 .....5.55
Bessemer,Ala. T2 .....5.55
Bethlehem,Pa. B2 .....5.55
Clairton,Pa. U5 .....5.55
Cleveland R2 .....5.55
Fairfield,Ala. T2 .....5.55
Fontana,Calif. K1 .....6.60
Gary,Ind. U5 .....5.55
Ind.Harbor,Ind. I-2 ....5.55
IndianaHarbor,Ind. Y1 ..6.05
Johnstown,Pa. B2 .....5.55
Lackawanna,N.Y. B2 ..5.55
Los Angeles B3 .....6.25
Pittsburgh J5 .....5.55
Seattle B3 .....6.30
So.Duquesne,Pa. U5 ....5.55
So.SanFrancisco B3 ....6.30
Struthers,O. Y1 .....6.05
Youngstown U5 .....5.55

BARS, Cold-Finished Carbon
Ambridge,Pa. W18 .....4.55
BeaverFalls,Pa. M12, R2 4.55
Buffalo B5 .....4.60
Camden,N.J. P13 .....5.00
Carnegie,Pa. C12 .....4.55
Chicago W18 .....4.55
Cleveland A7, C20 .....4.55
Detroit P17 .....4.70
Donora,Pa. A7 .....4.55
Elyria,O. W8 .....4.55
FranklinPark,Ill. N5 ....4.55
Gary,Ind. R2 .....4.55
GreenBay,Wis. F7 .....4.55
Hammond,Ind. L2, M13.4.55
Hartford,Conn. R2 .....5.10
Harvey,Ill. B5 .....4.55
LosAngeles R2 .....6.00
Mansfield,Mass. B5 ....5.10
Massillon,O. R2, R8 ....4.55
Monaca,Pa. S17 .....4.55
Newark,N.J. W18 .....5.00
Plymouth,Mich. P5 .....4.80
Pittsburgh J5 .....4.55
Putnam,Conn. W18 .....5.10
Readville,Mass. C14 ....5.10
St.Louis,Mo. M5 .....4.95
So.Chicago,Ill. W14 ....4.55
SpringCity,Pa.(5) K3 ...5.00
Struthers,O. Y1 .....4.55
Waukegan,Ill. A7 .....4.55
Youngstown F3, Y1 ....4.55

BARS, Cold-Finished Alloy
Ambridge,Pa. W18 .....5.40
BeaverFalls,Pa. M12 ....5.40
Bethlehem,Pa. B2 .....5.40
Buffalo B5 .....5.40
Camden,N.J. P13 .....5.80
Canton,O. R2 .....5.40
Canton,O.(29) T7 .....4.90
Carnegie,Pa. C12 .....5.40
Chicago W18 .....5.40
Cleveland A7 .....5.45
Cleveland C20 .....5.40
Detroit P17 .....5.55
Donora,Pa. A7 .....5.45
Elyria,O. W8 .....5.40
Gary,Ind. R2 .....5.40
Hammond,Ind. L2, M13.5.40
Hartford,Conn. R2 .....5.85
Harvey,Ill. B5 .....5.40
Lackawanna,N.Y. B2 ..5.40
Mansfield,Mass. B5 ....5.85
Massillon,O. R2, R8 ....5.40
Midland,Pa. C18 .....5.40
Monaca,Pa. S17 .....5.40
Newark,N.J. W18 .....5.75
Plymouth,Mich. P5 .....5.60
So.Chicago,Ill. R2, W14.5.40
Struthers,O. Y1 .....5.40
Warren,O. C17 .....5.40
Waukegan,Ill. A7 .....5.45
Worcester,Mass. A7 ....5.75
Youngstown F3, Y1 ....5.40

RAIL STEEL BARS
ChicagoHts.(3,4) C2 ...4.75
ChicagoHts.(3,4) I-2 ...4.75
Franklin,Pa.(3,4) F5 ...4.75
FortWorth,Tex.(26) T4..4.85
Huntngtn.W.Va.(3) W7.5.50
Marion,O.(3) P11 .....4.75
Moline,Ill.(3) R2 .....3.80
Tonawanda(3,4) B12 ....4.75
Williamsport(3) S19 ....5.00
Williamsport(4) S19 ....5.10

BARS, Wrought Iron
Dover,N.J.(Staybolt)U1 15.00
Dover(Eng.Bolt) U1 ....13.50
Dover(Wrght.Iron) U1 ..12.25
Economy,Pa.(S.R.) B14..9.60
Economy,Pa.(D.R.)B14 11.90
Economy(Staybolt) B14 12.20
McK.Rks.(Staybolt)L5 .14.50
McK.Rks(S.R.) L5 ....9.60
McK.Rks.(D.R.) L5 ...13.00

BARS, Reinforcing (Fabricators)
AlabamaCity,Ala. R2 ..3.70
Atlanta A11 .....4.25
Buffalo R2 .....3.70
Cleveland R2 .....3.70
Emeryville,Calif. J7 ....4.45
Fairfield,Ala. T2 .....3.70
Fontana,Calif. K1 .....4.40
Gary,Ind. U5 .....3.70
Houston S5 .....4.40
Johnstown,Pa. B2 .....3.70
KansasCity,Mo. S5 ....4.30
Lackawanna,N.Y. B2 ..3.70
LosAngeles B3 .....4.55
Milton,Pa. B6 .....4.55
Monaca,Pa. S17 .....4.55
Newark,N.J. W18 .....5.00
Niles,Calif. P1 .....4.55
Pittsburgh J5 .....4.55
Seattle B3 .....4.80
So.Chicago R2, U5, W14.3.70
So.SanFrancisco B3 ....4.80
Sparrowspoint,Md. B2 ..3.70
Torrance,Calif. C11 ....4.30
Warren,O. R2 .....3.70
Weirton,W.Va. W6 .....3.70
Youngstown U5, Y1 ....3.70

SHEETS, H.R. (19 gage)
AlabamaCity,Ala. R2 ..4.75
Dover,O. R1 .....5.65
Ind.Harbor,Ind. I-2 ....5.40
Mansfield,O. E6 .....5.65
Niles,O. N12 .....5.75
Torrance,Calif. C11 ....5.40

SHEETS, H.R. (14 ga., heavier)
High-Strength Low-Alloy
Cleveland J5, R2 .....5.40
Conshohocken,Pa. A3 ....5.65
Ecorse,Mich. G5 .....5.95
Fairfield,Ala. T2 .....5.40
Fontana,Calif. K1 .....6.35
Gary,Ind. U5 .....5.40
Ind.Harbor,Ind. I-2 ....5.40
Ind.Harbor,Ind. Y1 ....5.90
Irvin,Pa. U5 .....5.40
Lackawanna(35) B2 ....5.40
Pittsburgh J5 .....5.40
Sharon,Pa. S3 .....5.40
So.Chicago,Ill. U5 .....5.40
SparrowsPoint(36) B2 ..5.40
Warren,O. R2 .....5.40
Weirton,W.Va. W6 .....5.75
Youngstown U5 .....5.40
Youngstown Y1 .....5.90

SHEETS, Cold-Rolled
High-Strength Low-Alloy
Cleveland J5, R2 .....6.65
Ecorse,Mich. G5 .....7.10
Fontana,Calif. K1 .....7.50
Gary,Ind. U5 .....6.55
IndianaHarbor,Ind. Y1..7.05
IndianaHarbor,Ind. I-2..6.55
Irvin,Pa. U5 .....6.55
Lackawanna(37) B2 ....6.55
Pittsburgh J5 .....6.55
SparrowsPoint(38) B2..6.55
Warren,O. R2 .....6.55
Weirton,W.Va. W6 .....6.90
Youngstown Y1 .....7.05

SHEETS, Cold-Rolled Steel (Commercial Quality)

Butler,Pa. A10	4.35
Cleveland J5 R2	4.35
Ecorse,Mich. G5	4.55
Fairfield,Ala. T2	4.35
Follansbee,W.Va. F4	5.35
Fontana,Calif. K1	5.30
Gary,Ind. U5	4.35
GraniteCity,Ill. G4	5.05
Ind.Harbor,Ind. I-2, Y1	4.35
Irvin,Pa. U5	4.35
Lackawanna,N.Y. B2	4.35
Middletown,O. A10	4.35
Pittsburg,Calif. C11	5.30
Pittsburgh J5	4.35
SparrowsPoint,Md. B2	4.35
Steubenville,O. W10	4.35
Warren,O. R2	4.35
Weirton,W.Va. W6	4.35
Youngstown Y1	4.35

SHEETS, Galv'd No. 10 Steel

AlabamaCity,Ala. R2	4.80
Ashland,Ky.(8) A10	4.80
Canton,O. R2	4.80
Dover,O. R1	5.50
Fairfield,Ala. T2	4.80
Gary,Ind. U5	4.80
Granite City,Ill. G4	5.50
Ind.Harbor,Ind. I-2	4.80
Irvin,Pa. U5	4.80
Kokomo,Ind.(13) C16	5.20
MartinsFerry,O. W10	4.80
Niles,O. N12	6.00
Pittsburg,Calif. C11	5.55
SparrowsPoint,Md. B2	4.80
Steubenville,O. W10	4.80
Torrance,Calif. C11	5.55
Weirton,W.Va. W6	4.80

SHEETS, Galvanized No. 10, High-Strength Low-Alloy

Irvin,Pa. U5	7.20
SparrowsPoint(39) B2	6.75

SHEETS, Galvanneal Steel

Canton,O. R2	5.35
Irvin,Pa. U5	5.35
Kokomo,Ind.(13) C16	5.75
Niles,O. N12	6.55

SHEETS, ZINCGRIP Steel No. 10

Butler,Pa. A10	5.05
Middletown,O. A10	5.05

SHEETS, Electro Galvanized

Cleveland R2 (28)	5.65
Niles,O. R2 (28)	5.65
Weirton,W.Va. W6	5.50

SHEETS, Zinc Alloy

Ind.Harbor,Ind I-2	5.70

SHEETS, Drum Body

Pittsburg,Calif. C11	4.30
Torrance,Calif. C11	4.30

SHEETS, Well Casing

Fontana,Calif. K1	5.10

BLUED Stock, 29 ga.

Yorkville,O. W10	6.80
Follansbee,W.Va.(23)F4	6.85

SHEETS, Enameling Iron

Ashland,Ky.(8) A10	4.65
Cleveland R2	4.65
Gary,Ind. U5	4.65
GraniteCity,Ill. G4	5.35
Ind.Harbor,Ind. I-2	4.65
Irvin,Pa. U5	4.65
Middletown,O. A10	4.65
Youngstown Y1	4.65

BLACK PLATE (Base Box)

Aliquippa,Pa. J5	$6.25
Fairfield,Ala. T2	6.35
Gary,Ind. U5	6.25
GraniteCity,Ill. G4	6.45
Ind.Harbor, Ind. I-2 Y1	6.25
Irvin,Pa. U5	6.25
Niles,O. R2	6.25
Pittsburg,Calif. C11	7.00
SparrowsPoint,Md. B2	6.35
Warren,O. R2	6.25
Weirton,W.Va. W6	6.25
Yorkville,O. W10	6.25

HOLLOWARE ENAMELING Black Plate (29 gage)

Follansbee,W.Va. F4	5.85
Gary,Ind U5	5.85
GraniteCity,Ill. G4	6.05
Ind.Harbor,Ind Y1	5.85
Irvin,Pa. U5	5.85
Yorkville,O. W10	6.15

SHEETS, Culvert

No. 16	Cu Alloy	Cu Fe
Ashland,Ky. A10	5.60	...
Canton,O. R2	5.65	6.10
Fairfield,Ala T2.	5.60	5.85
Gary,Ind. U5	5.60	5.85
IndianaHarbor I-2	5.60	5.85
Irvin,Pa. U5	5.60	5.85
Kokomo,Ind. C16.	6.25	...
MartinsFy,O. W10	5.60	5.85
Pittsburg,Cal. C11	6.35	...
SparrowsPt. B2	5.60	...
Torrance,Cal. C11	6.35	...

SHEETS, Culvert, No. 16 Pure Iron

Ashland,Ky. A10	5.85
Fairfield,Ala T2	5.85

SHEETS, Hot-Rolled Ingot Iron 18 Gage and Heavier

Ashland,Ky.(8) A10	3.85
Cleveland R2	4.20
Ind.Harbor,Ind. I-2	3.85
Warren,O. R2	4.20

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2	4.95
Middletown,O. A10	4.85
Warren,O. R2	4.95

SHEETS, Galvanized Ingot Iron No. 10 flat

Ashland,Ky.(8) A10	5.05
Canton,O. R2	5.55

SHEETS, ZINCGRIP Ingot Iron

Butler,Pa. A10	5.30
Middletown,O. A10	5.30

SHEETS. ALUMINIZED

Butler,Pa. A10	8.15

TIN PLATE, Electrolytic (Base Box)

	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$7.15	$7.40	$7.80
Fairfield,Ala. T2	7.25	7.50	7.90
Gary,Ind. U5	7.15	7.40	7.80
GraniteCity,Ill. G4	7.35	7.60	8.00
Ind.Harbor,Ind. I-2, Y1	7.15	7.40	7.80
Irvin,Pa. U5	7.15	7.40	7.80
Niles,O. R2	7.15	7.40	7.80
Pittsburg,Calif. C11	7.90	8.15	8.55
SparrowsPoint,Md. B2	7.25	7.50	7.90
Weirton,W.Va. W6	7.15	7.40	7.80
Yorkville,O. W10	7.15	7.40	7.80

SHEETS, SILICON, H.R. or C.R.(22 Ga.) COILS (Cut Lengths ½c lower)

	Field	Arma-ture	Elec-tric	Motor	Dyna-mo
BeechBottom W10 (cutlengths)	...	...	7.25	8.50	9.30
Brackenridge,Pa. A4	...	...	7.75	9.00	9.80
GraniteCity,Ill. G4 (cut lengths)	...	...	7.95	9.20	...
Ind.Harbor,Ind. I-2	6.95	7.25	(34)	...	...
Mansfield,O. E6 (cut lengths)	7.10	7.25	7.75	9.00	9.80
Niles,O. N12 (cut lengths)	...	6.75	7.25	...	...
Vandergrift,Pa. U5	...	7.25	7.75	9.00	9.80
Warren,O. R2	6.95	7.25	7.75	9.00	9.80
Zanesville,O. A10	...	7.25	7.75	9.00	9.80

SHEETS, SILICON (22 Ga. Base) Coils (Cut Lengths ½c lower) Transformer Grade

	72	65	58	52
BeechBottom W10 (cut lengths)	9.85	10.40	11.10	11.90
Brackenridge,Pa. A4	10.35	....	....	....
Vandergrift,Pa. U5	10.35	10.90	11.60	12.40
Warren,O. R2	10.35	....	....	....
Zanesville,O. A10	10.35	10.90	11.60	12.40

H.R. or C.R. COILS AND CUT LENGTHS, SILICON (22 Ga.)

	T-100	T-90	T-80	T-73
Butler,Pa. A10 (C.R.)	....	....	14.75	15.25
Vandergrift,Pa. U5	12.90	13.75	14.75	15.25

TINPLATE, American Coke (Base Box)

	1.25 lb	1.50 lb
Aliquippa,Pa. J5	$8.45	$8.70
Fairfield,Ala. T2	8.55	8.80
Gary,Ind. U5	8.45	8.70
Ind.Har. I-2, Y1.	8.45	8.70
Irvin,Pa. U5	8.45	8.70
Pitts.,Cal. C11	9.20	9.45
Sp.Pt.,Md. B2	8.55	8.80
Warren,O. R2	8.45	8.70
Weirton,W.Va.W6.	8.45	8.70
Yorkville,O. W10.	8.45	8.70

MANUFACTURING TERNES (Special Coated)

Fairfield,Ala. T2	$7.60
Gary,Ind. U5	7.50
Irvin,Pa. U5	7.50
SparrowsPoint,Md. B2	7.60
Yorkville,O. W10	7.50

SHEETS, LT. Coated Ternes, 6 lb

Yorkville,O. W10	$8.40

SHEET, Mfg. Ternes, 8 lb (Commercial Quality)

Gary,Ind. U5	$9.50
Yorkville,O. W10	9.50

SHEET, Long Terne Steel (Commercial Quality)

BeechBottom,W.Va.W10	5.20
Gary,Ind. U5	5.20
Mansfield,O. E6	6.05
Middletown,O. A10	5.20
Niles,O. N12	6.00
Weirton,W.Va. W6	5.20

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10	5.60

ROOFING SHORT TERNES (8 lb Coated)

Gary,Ind. U5	9.50

STRIP, Hot-Rolled High-Strength Low-Alloy

Bessemer,Ala. T2	5.30
Conshohocken,Pa. A3	5.55
Ecorse,Mich. G5	5.95
Fairfield,Ala. T2	5.30
Fontana,Calif. K1	6.20
Gary,Ind. U5	5.30
Ind.Harb.,Ind. I-2	5.30
IndianaHarbor,Ind. Y1	5.80
Lackawanna,N.Y. B2	4.95
LosAngeles(25) B3	6.05
Seattle B3	6.30
Sharon,Pa. S3	5.40
So.SanFrancisco(25) B3	6.05
SparrowsPoint,Md. B2	4.95
Warren,O. R2	5.30
Weirton,W.Va. W6	5.75
Youngstown Y1	5.80
Youngstown U5	5.30

STRIP, Cold-Rolled High-Strength Low-Alloy

Cleveland J5	6.70
Cleveland A7	6.55
Dover,O. G6	7.30
Fontana,Calif. K1	6.95
Lackawanna,N.Y. B2	6.40
Sharon,Pa. S3	6.55
SparrowsPoint,Md. B2	6.40
Warren,O. R2	6.55
Weirton,W.Va. W6	7.20
Youngstown Y1	7.05

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2	3.50
Alton,Ill. L1	3.95
Ashland,Ky.(8) A10	3.50
Atlanta A11	4.05
Bessemer,Ala. T2	3.50
Bridgeprt,Conn.(10) S15	4.00
Buffalo(27) R2	3.50
Butler,Pa. A10	3.50
Carnegie,Pa. S18	4.00
Conshohocken,Pa. A3	3.90
Detroit M1	4.40
Ecorse,Mich. G5	3.80
Fairfield,Ala. T2	3.50
Fontana,Calif. K1	4.75
Gary,Ind. U5	3.50
Houston,Tex. S5	4.90
Ind.Harbor,Ind. I-2, Y1	3.50
Johnstown,Pa.(25) B2	3.50
KansasCity,Mo.(9) S5	4.10
Lackawanna,N.Y.(32)B2	3.50
LosAngeles B3	4.25
Milton,Pa. B6	4.35
Minnequa,Colo. C10	4.55
NewBritain(10) S15	4.00
No.Tonawanda,N.Y. B11	3.50
Pittsburg,Calif. C11	4.25
Riverdale,Ill. A1	3.50
SanFrancisco S7	4.85
Seattle B3, N14	4.50
Sharon,Pa. S3	4.00
So.Chicago,Ill. W14	3.50
So.SanFrancisco B3	4.25
SparrowsPoint,Md. B2	3.50
Torrance,Calif. C11	4.25
Warren,O. R2	3.50
Weirton,W.Va. W6	3.60
WestLeechburg,Pa. A4	3.75
Youngstown U5, Y1	3.50

STRIP, Hot-Rolled Alloy

Bridgeprt,Conn.(10) S15	5.45
Carnegie,Pa. S18	5.85
Fontana,Calif. K1	6.70
Gary,Ind. U5	5.50
Houston,Tex. S5	5.90
KansasCity,Mo. S5	6.10
Midland,Pa. C18	5.85
NewBritn,Conn.(10) S15	5.45
Sharon,Pa. S3	5.85
Youngstown U5	5.50

STRIP, Cold-Rolled Carbon

Anderson,Ind.(40) G6	5.50
Berea,O. C7	6.60
Bridgeprt,Conn.(10) S15	5.35
Butler,Pa. A10	4.65
Cleveland A7, J5	4.65
Dearborn,Mich. D3	5.60
Detroit D2	5.60
Detroit M1	5.45
Dover,O.(40) G6	5.50
Ecorse,Mich. G5	4.85
Follansbee,W.Va. F4	5.35
Fontana,Calif. K1	6.30
FranklinPark,Ill.(40)T6	4.90
Ind.Harbor,Ind. I-2	4.90
Lackawanna,N.Y. B2	4.65
LosAngeles C1	6.40
Mattapan,Mass. T6	5.50
Middletown,O. A10	4.65
NewBritain(10) S15	5.35
NewCastle,Pa. B4	5.35
NewCastle,Pa.(40) E5	5.25
NewHaven,Conn. D2	5.85
NewHaven,Conn. A7	5.15
Pawtucket,R.I. R3	6.00
Pawtucket,R.I.(21) N8	5.85
Riverdale,Ill.(40) A1	4.90
Rome,N.Y. R6	5.10
Sharon,Pa. S3	5.35
SparrowsPoint,Md. B2	4.65
Trenton,N.J. R5	6.00
Wallingford,Conn. W2	5.85
Warren,O.(40) T5	5.25
Warren,O. R2	4.65
Weirton,W.Va. W6	4.65
Youngstown C8 (40)	5.25
Youngstown Y1	4.65

STRIP, Electro Galvanized

Dover,O. G6	5.50
Warren,O. T5	5.25
Weirton,W.Va. W6	4.65
Youngstown C8	5.25

STRIP, Cold-Finished, Spring Steel (Annealed)

	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Berea, O. C7	...	6.80	7.40	9.35	11.65
Bridgeport,Conn.(10) S15	5.35	6.80	7.40	9.35	11.65
Bristol,Conn. W1	...	...	7.70	9.65	....
Carnegie,Pa. S18	...	6.80	7.40	9.35	11.65
Cleveland A7	4.65	6.45	7.40	9.35	11.65
Dearborn,Mich. D3	5.60	7.05	7.65	...	....
Detroit D2	5.60	6.65	7.25	...	....
Dover,O. G6	5.50	6.80	7.40	9.35	11.65
FranklinPark,Ill. T6	5.00	6.60	7.55	9.50	11.80
Harrison,N.J. C18	....	...	7.70	9.65	11.95
Mattapan,Mass. T6	5.50	6.75	7.70	9.65	11.95
NewBritn.,Conn.(10) S15	5.35	6.80	7.40	9.35	11.65
NewCastle,Pa. B4	5.35	6.80	7.40	9.35	....
NewCastle,Pa. E5	5.50	6.80	7.40	9.35	11.65
NewHaven,Conn. D2	5.85	6.75	7.35	...	....
NewYork W3	...	7.10	7.70	9.65	11.95
Pawtucket,R.I. N8:					
Cleve.orPitts.Base	...	6.80	7.40	9.35	11.65
Worcester,Mass.,Base	5.85	7.10	7.70	9.65	11.95
Sharon,Pa. S3	5.35	6.80	7.40	9.35	11.65
Trenton,N.J. R5	...	7.10	7.70	9.65	11.95
Wallingford,Conn. W2	5.85	6.75	7.35	9.30	11.60
Weirton,W.Va. W6	5.35	6.80	7.40	9.35	11.65
Worcester,Mass. A7	4.95	6.75	7.70	9.65	11.95
Worcester,Mass. T6	5.50	6.75	7.70	9.65	11.95
Youngstown C8	...	6.80	7.40	9.35	11.65

Spring Steel (Tempered)

Trenton,N.J. R5	...	...	10.30	12.50	15.35
Harrison,N.J. C18	...	...	10.30	12.50	15.35
NewYork W3	...	...	10.30	12.50	15.35

Key to Producers

A1 Acme Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A7 American Steel & Wire
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.
A13 American Cladmetals Co.

B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B6 Boiardi Steel Corp.
B8 Braeburn Alloy Steel
B11 Buffalo Bolt Co.
B12 Buffalo Steel Co.
B14 A. M. Byers Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div. Borg-Warner Corp.
C4 Carpenter Steel Co.
C5 Central Iron & Steel Div. Barium Steel Corp.
C7 Cleve. Cold Rolling Mills
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Steel Corp.

D2 Detroit Steel Corp.
D3 Detroit Tube & Steel
D4 Disston & Sons, Henry
D6 Driver Harris Co.
D7 Dickson Weatherproof Nail Co.

E1 Eastern Gas&Fuel Assoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.

F2 Firth Sterling Inc.
F3 Fitzsimons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div. Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire

G2 Globe Iron Co.
G3 Globe Steel Tubes Co.
G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.

H1 Hanna Furnace Corp.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div. Borg-Warner Corp.
I-7 Indiana Steel & Wire Co.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

STRIP, Cold-Rolled Alloy Steel

Bridgeprt,Conn. (10)	$15 10.75
Carnegie,Pa.	S18 .....10.60
Cleveland A7	.....10.00
Dover,O.	G6 .....10.50
Fontana,Calif.	K1 .....11.65
Harrison,N.J.	C18 .....10.60
Midland,Pa.	C18 .....10.60
NewBritn,Conn. (10)	S15 10.75
Pawtucket,R.I. (11)	N8 .10.75
Pawtucket,R.I. (12)	N8 .11.05
Sharon,Pa.	S3 .....10.60
Worcester,Mass.	A7 ...10.30
Youngstown	C8 .....10.60

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky. (8)	A10 ....3.75
Warren,O.	R2 .....4.10

STRIP, Cold-Rolled Ingot Iron

Warren,O.	R2 .....5.25

TIGHT COOPERAGE HOOP

Atlanta	A11 .....4.05
Riverdale,Ill.	A1 .....3.90
Sharon,Pa.	S3 .....4.15
Youngstown	U5 .....3.75

WIRE, Tire Bead

Bartonville,Ill. (1)	K4 ..10.90
Monessen,Pa.	P16 .....11.40
Roebling,N.J.	R5 .....11.55

WIRE, Merchant Quality

(6 to 8 gage)	An'ld.	Galv.
AlabamaCity	R2.. 5.70	5.95
Aliquippa	J5 .... 5.70	6.15
Atlanta	A11 .... 5.95	6.40
Bartonville(19)	K4 5.70	6.15
Buffalo	W12 .... 4.85	...
Cleveland	A7 .... 5.70	6.15
Crawfordsville	M8 5.95	6.40
Donora,Pa.	A7 .. 5.70	6.15
Duluth,Minn.	A7 . 5.70	6.15
Fairfield	T2 .... 5.70	6.15
Houston,Tex.	S5 . 6.10	6.55
Johnstown	B2 .... 5.70	6.15
Joliet,Ill.	A7 .... 5.70	6.15
KansasCy,Mo.	S5. 6.30	6.75
Kokomo	C16 .. 5.80	6.05
LosAngeles	B3 .. 6.65	...
Minnequa	C10 ... 5.95	6.45
Monessen	P7 .... 5.95	6.40
Palmer	W12 .... 5.15	...
Pitts.,Calif.	C11.. 6.65	6.80
Prtsmth. (18)	P12 . 6.10	6.60
Rankin	A7 ..... 5.70	6.15
So.Chicago	R2 .. 5.70	5.95
So.S.Fran.	C10 .. 6.65	7.10
SparrowsPt,	B2 .. 5.80	6.25
Sterling,Ill. (1)	N15 5.70	6.15
Struthers,O.	Y1 .. 5.70	6.15
Torrance,Cal.	C11 6.65	...
Worcester	A7 .... 6.00	6.45

ROPE WIRE

	(A)	(B)
Alton,Ill.	L1 .... 8.65	8.90
Bartonville,Ill.	K4 8.55	8.80
Buffalo	W12 .... 8.55	8.80
Fostoria,O.	S1 .. 8.85	9.10
Johnstown,Pa.	B2 8.55	8.80
Monessen,Pa.	P16 8.55	8.80
Monessen,Pa.	P7. 8.80	9.05
Muncie,Ind.	I-7 .. 8.75	9.00
Palmer,Mass.	W12. 8.85	9.10
Portsmouth,O.	P12 8.55	8.80
Roebling,N.J.	R5. 8.85	9.10
SparrowsPt.	B2 .. 8.65	8.90
Struthers,O.	Y1 .. 8.55	8.80
Worcester	J4, T6. 8.85	9.10

(A) Plow and Mild Plow.
(B) Improved Plow.

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala.	R2 ..4.85
Aliquippa,Pa.	J5 .....4.85
Atlanta	A11 .....5.10
Alton,Ill.	L1 .....5.05
Bartonville,Ill. (1)	K4 ..4.85
Buffalo	W12 .....4.85
Chicago	W13 .....5.10
Cleveland	A7, C20 ....4.85
Crawfordsville,Ind.	M8..5.10
Donora,Pa.	A7 .....4.85
Duluth,Minn.	A7 .....4.85
Fairfield,Ala.	T2 .....4.85
Fostoria,O.	(24) S1 ....5.35
Houston	S5 .....5.25
Johnstown,Pa.	B2 .....4.85
Joliet,Ill.	A7 .....4.85
KansasCity,Mo.	S5 .....5.45
Kokomo,Ind.	C16 .....4.95
LosAngeles	B3 .....5.80
Minnequa,Colo.	C10 ....5.10
Monessen,Pa.	P7 .....5.10
Newark	6-8 ga. I-1 ....5.50
No.Tonawanda	B11 ....4.85
Palmer,Mass.	W12 ....5.15
Pittsburg,Calif.	C11 ....5.80
Portsmouth,O.	P12 .....5.25
Rankin,Pa.	A7 .....4.85
So.Chicago,Ill.	R2 .....4.85
So.SanFrancisco	C10 ...5.80
SparrowsPoint,Md.	B2 ..4.95
Sterling,Ill. (1)	N15 ....4.85
Struthers,O.	Y1 .....4.85
Torrance,Calif.	C11 ....5.80
Waukegan,Ill.	A7 .....4.85
Worcester,Mass.	A7, T6.5.15

WIRE, Cold-Rolled Flat

Anderson,Ind.	G6 .....6.20
Buffalo	W12 .....6.35
Cleveland	A7 .....5.85
Crawfordsville,Ind.	M8..6.20
Detroit	D2 .....6.20
Dover,O.	G6 .....6.20
Fostoria,O.	S1 .....6.00
Kokomo,Ind.	C16 .....5.70
FranklinPark,Ill.	T6 ...6.20
Massillon,O.	R8 .....5.85
Monessen,Pa.	P16 .....5.85
Monessen,Pa.	P7 .....6.10
NewHaven,Conn.	D2 ...6.50
Pawtucket,R.I. (12)	N8..6.85
Trenton,N.J.	R5 .....6.15
Worcester,Mass.	A7 ....6.15
Worcester,Mass.	T6 ....6.50
Worcester,Mass.	W12 ..6.65

WIRE, Galv'd ACSR for Cores

Bartonville,Ill.	K4 .....8.50
Monessen,Pa.	P16 .....8.50
Muncie,Ind.	I-7 .....8.70
Roebling,N.J.	R5 .....8.80
SparrowsPoint,Md.	B2 ..8.60
Johnstown,Pa.	B2 .....8.50

WIRE (16 gage)	Ani'd. Stone	Galv. Stone
Aliquippa	J5 ....10.15	12.15
Bartonville(1)	K4 .10.25	11.95
Cleveland	A7 ....10.25	12.15
Crawfrdsville	M8 .10.30	12.00
Fostoria,O.	S1 ...10.40	13.00
Johnstown	B2 ....10.25	12.15
Kokomo	C16 ....10.25	11.95
Minnequa	C10 ...10.40	12.40
Palmer,Mass.	W12.10.25	12.15
Pitts.Cal.	C11 ....10.60	12.50
Prtsmth. (18)	P12.10.55	12.30
SparrowsPt.	B2. .10.35	12.25
Waukegan	A7 ...10.25	12.15

WIRE, MB Spring, High Carbon

Aliquippa,Pa.	J5 .....6.25
Alton,Ill.	L1 .....6.45
Bartonville,Ill. (1)	K4 ..6.25
Buffalo	W12 .....6.25
Cleveland	A7 .....6.25
Donora,Pa.	A7 .....6.25
Duluth,Minn.	A7 .....6.25
Fostoria,O.	S1 .....6.25
Johnstown,Pa.	B2 .....6.25
LosAngeles	B3 .....7.20
Milbury,Mass.	(12) N6 ..8.05
Monessen,Pa.	P7, P16...6.25
Muncie,Ind.	I-7 .....6.45
Palmer,Mass.	W12 .....6.55
Pittsburg,Calif.	C11 ....7.20
Roebling,N.J.	R5 .....6.55
Portsmouth,O.	P12 .....6.25
So.Chicago,Ill.	R2 .....6.25
So.SanFrancisco	C10 ....7.20
SparrowsPoint,Md.	B2 ..6.35
Struthers,O.	Y1 .....6.25
Trenton,N.J.	A7 .....6.55
Waukegan,Ill.	A7 .....6.25
Worcester	A7, T6, W12..6.55
Worcester,Mass.	J4 ....6.75

WIRE, Fine & Weaving (8" Coils)

Bartonville,Ill. (1)	K4 ...8.90
Buffalo	W12 .....8.90
Chicago	W13 .....8.90
Cleveland	A7 .....8.90
Crawfordsville,Ind.	M8..8.95
Fostoria,O.	S1 .....8.90
Johnstown,Pa.	B2 .....8.90
Kokomo,Ind.	C16 .....8.90
Monessen,Pa.	P16 .....8.90
Muncie,Ind.	I-7 .....9.10
Palmer,Mass.	W12 .....9.20
Portsmouth,O.	P12 .....8.90
Roebling,N.J.	R5 .....9.20
Waukegan,Ill.	A7 .....8.90
Worcester,Mass.	A7, T6 .9.20

WIRE, Barbed	Col.
AlabamaCity,Ala.	R2 ...137
Aliquippa,Pa.	J5 141
Atlanta	A11 144
Bartonville,Ill. (19)	K4 ...144
Crawfordsville,Ind.	M8 ..146
Donora,Pa.	A7 141
Duluth,Minn.	A7 141
Fairfield,Ala.	T2 141
Houston,Tex.	S5 149
Johnstown,Pa.	B2 141
Joliet,Ill.	A7 141
KansasCity,Mo.	S5 153
Kokomo,Ind.	C16 143
Minnequa,Colo.	C10 147
Monessen,Pa.	P7 146
Pittsburg,Calif.	C11 161
Portsmouth,O. (18)	P12...148
Rankin,Pa.	A7 141
So.Chicago,Ill.	R2 137
So.SanFran.,Calif.	C10 ..161
SparrowsPoint,Md.	B2 ..143
Sterling,Ill. (1)	N15 141

BALE TIES, Single Loop	Col.
AlabamaCity,Ala.	R2 ...123
Atlanta	A11 126
Bartonville,Ill. (19)	K4 ..123
Crawfordsville,Ind.	M8 ..132
Donora,Pa.	A7 123
Duluth,Minn.	A7 123
Fairfield,Ala.	T2 123
Joliet,Ill.	A7 123
KansasCity,Mo.	S5 135
Kokomo,Ind.	C16 125
Minnequa,Colo.	C10 128
Pittsburg,Calif.	C11 147
So.Chicago,Ill.	R2 123
So.SanFran.,Calif.	C10 ..147
SparrowsPoint,Md.	B2...125
Sterling,Ill. (1)	N15 123

WIRE, Upholstery Spring

Aliquippa,Pa.	J5 .....5.90
Alton,Ill.	L1 .....6.10
Buffalo	W12 .....5.90
Cleveland	A7 .....5.90
Donora,Pa.	A7 .....5.90
Duluth,Minn.	A7 .....5.90
Johnstown,Pa.	B2 .....5.90
LosAngeles	B3 .....6.85
Monessen,Pa.	P7, P16 ..5.90
NewHaven,Conn.	A7 ...6.20
Palmer,Mass.	W12 .....6.20
Pittsburg,Calif.	C11 ....6.85
Portsmouth,O.	P12 .....5.90
Roebling,N.J.	R5 .....6.20
So.Chicago,Ill.	R2 .....5.90
So.SanFrancisco	C10 ....6.85
SparrowsPoint,Md.	B2 ..6.00
Torrance,Calif.	C11 ....6.85
Trenton,N.J.	A7 .....6.20
Waukegan,Ill.	A7 .....5.90
Worcester,Mass.	A7 ....6.20

WOVEN FENCE, 9-15½Ga.

	Col.
AlabamaCity,Ala.	R2 ...127
Ala.City,Ala.,17-18ga.	R2 214
Aliquippa,Pa.	9-14½ga.J5 131
Atlanta	A11 134
Bartonville,Ill. (19)	K4 .131
Crawfordsville,Ind.	M8 ..133
Donora,Pa.	A7 131
Duluth,Minn.	A7 131
Fairfield,Ala.	T2 131
Houston,Tex.	S5 139
Johnstown,Pa.	B2 131
Johnstown,17ga.,6"	B2...205
Johnstown,17ga.,4"	B2...208
Joliet,Ill.	A7 131
KansasCity,Mo.	S5 143
Kokomo,Ind.	C16 133
Minnequa,Colo.	C10 139
Monessen,Pa.	P7 136
Pittsburg,Calif.	C11 154
Portsmouth,O. (18)	P12 ..138
Rankin,Pa.	A7 131
So.Chicago,Ill.	R2 127
Sterling,Ill. (1)	N15 131

FENCE POSTS

ChicagoHts.,Ill.	C2 140
Duluth,Minn.	A7 125
Franklin,Pa.	F5 140
Huntington,W.Va.	W7 140
Johnstown,Pa.	B2 140
Marion,O.	P11 140
Minnequa,Colo.	C10 130
Moline,Ill.	R2 136
So.Chicago,Ill.	R2 140
Tonawanda,N.Y.	B12 140
Williamsport,Pa.	S19 150

TRACK BOLTS (20) Treated

KansasCity,Mo.	S5 .....9.85
Lebanon,Pa. (31)	B2 ....9.85
Minnequa,Colo.	C10 ....9.85
Pittsburgh	O3, P14 ....9.85
Seattle	B3 .....10.35

NAILS & STAPLES, Stock

To dealers & mfrs. (7)	Col.
AlabamaCity,Ala.	R2 ...118
Aliquippa,Pa. (13)	J5 ...118
Atlanta	A11 121
Bartonville,Ill. (19)	K4 ...118
Chicago,Ill.	W13 118
Cleveland	A9 125
Crawfordsville,Ind.	M8 ..122
Donora,Pa.	A7 118
Duluth,Minn.	A7 118
Fairfield,Ala.	T2 118
Galveston,Tex.	D7 126
Houston,Tex.	S5 126
Johnstown,Pa.	B2 118
Joliet,Ill.	A7 118
KansasCity,Mo.	S5 130
Kokomo,Ind.	C16 120
Minnequa,Colo.	C10 123
Monessen,Pa.	P7 124
Pittsburg,Calif.	C11 137
Portsmouth,O.	P12 124
Rankin,Pa.	A7 118
So.Chicago,Ill.	R2 118
SparrowsPoint,Md.	B2...120
Sterling,Ill. (1)	N15 118
Torrance,Calif.	C11 138
Worcester,Mass.	A7 124

NAILS, Cut (100 lb keg)

To dealers (33)	
Conshohocken,Pa.	A3..$7.35
Wheeling,W.Va.	W10 ...7.35

TIE PLATES

Fairfield,Ala.	T2 .....4.50
Gary,Ind.	U5 .....4.50
Ind.Harbor,Ind.	I-2 ....4.50
Lackawanna,N.Y.	B2 ..4.50
Minnequa,Colo.	C10 ....4.50
Pittsburg,Calif.	C11 ....4.65
Seattle	B3 .....4.65
Steelton,Pa.	B2 .....4.50
Torrance,Calif.	C11 ....4.65

JOINT BARS

Bessemer,Pa.	U5 .....4.70
Fairfield,Ala.	T2 .....4.70
Ind.Harbor,Ind.	I-2 ....4.70
Joliet,Ill.	U5 .....4.70
Lackawanna,N.Y.	B2 ..4.70
Minnequa,Colo.	C10 ....4.70
Steelton,Pa.	B2 .....4.70

STANDARD TRACK SPIKES

Ind.Harbor,Ind.	I-2, Y1..6.15
KansasCity,Mo.	S5 ....6.40
Lebanon,Pa.	B2 .....6.15
Minnequa,Colo.	C10 ....6.15
Pittsburgh	J5 .....6.15
Seattle	B3 .....6.65
So.Chicago,Ill.	R2 .....6.15
Struthers,O.	Y1 .....6.15
Youngstown	R2 .....6.15

AXLES

Ind.Harbor,Ind.	S13 ....5.60
Johnstown,Pa.	B2 .....5.60

RAILS	Std. No. 1	Std. No. 2	Std. All No. 2	Tee Rails 60 lb Under
Bessemer,Pa. U5	3.60	3.50	3.55	4.00
Ensley,Ala. T2	3.60	3.50	...	4.00
Fairfield,Ala. T2	...	...	...	4.00
Gary,Ind. U5	3.60	3.50	3.55	...
Huntington,W.Va. W7	...	...	...	5.00
Ind.Harbor,Ind. I-2	3.60	3.50	3.55	...
Johnstown,Pa. B2	...	...	...(16)	4.00
Lackawanna,N.Y. B2	3.60	3.50	...	4.00
Minnequa,Colo. C10	3.60	3.50	...	4.50
Steelton,Pa. B2	3.60	3.50	...	...
Williamsport,Pa. S19	...	...	...	4.75

TOOL STEEL

Grade	$ per lb
Regular Carbon	0.230
Extra Carbon	0.270
Special Carbon	0.325
Oil Hardening	0.350
5% Cr Hot Work	0.350
Hi-Carbon-Cr	0.635

Grade by Analysis

W	Cr	V	Co	
18	4	1	....	1.505
18	4	2	....	1.650
20.25	4.25	1.6	12.25	3.535-3.675
19	4	2	7	2.460
18.25	4.25	1	4.75	2.125
18	4	2	9	2.445-2.45
13.5	4	3	....	1.6025

W	Cr	V	Mo	
6.4	4.5	19.5	5	0.96-0.965
6	4	3	6	1.190
1.5	4	1	8.5	0.810

Tool steel products include: A4, A8, B2, B8, C4, C9, C13, C18, D4, F2, J3, L3, M14, S8, U4, V2 and V3.

Footnotes:
(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) Philadelphia del.
(6) Chicago or Birm. base.
(7) To jobbers, 3 cols. lower.
(8) 16 gage and heavier.
(9) 6 in. and narrower.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass. base.
(13) Add 0.50c for 17 Ga. & heavier.
(14) Also wide flange beams.
(15) ⅛" and thinner.
(16) 40 lb and under.
(17) Flats only.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) 0.25c off for untreated.
(21) New Haven, Conn., base.
(22) Del. San Francisco Bay area.
(23) 28 Ga. 36" wide.
(24) Deduct 0.20c, finer than 15 Ga.
(25) Bar mill bands.
(26) Reinforcing, mill lengths, to fabricators; to consumers, 5.60c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Subject to 10% increase.
(30) Sheared; add 0.35c for universal mill.
(31) Not annealed.
(32) Rd. or square edge.
(33) To jobbers, deduct 20c.
(34) 7.25c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) 15 gage & lighter: 60" & narrower.
(38) 14 gage & lighter: 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035": 0.035" and heavier, 0.25c higher.

Key to Producers

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M5 Medart Co.
M6 Mercer Tube & Mfg. Co.
M8 Mid-States Steel & Wire
M9 Midvale Co.
M12 Moltrup Steel Products
M13 Monarch Steel Co.
M14 McInnes Steel Co.

N2 National Supply Co.
N3 National Tube Div.
N5 Nelsen Steel & Wire Co.
N6 NewEng-HighCarb.Wire
N8 Newman-Crosby Steel
N12 Niles Rolling Mill Div.
N14 Nrthwst. Steel Roll. Mills
N15 Northwestern S.&W. Co.
N16 New Delphos Mfg. Co.

O3 Oliver Iron & Steel Corp.
O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P9 Pittsburgh Tube Co.
P11 Pollak Steel Co.
P12 Portsmouth Division, Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.

R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 RelianceDiv.,EatonMfg.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S5 Sheffield Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S9 Sloss-Sheffield S.&I. Co.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S16 Struthers Iron & Steel
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
S24 Seidelhuber Steel

T2 Tenn. Coal & Iron Div.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div. Am. Rad. & Stan. San.

U1 Ulster Iron Works
U4 Universal Cyclops Steel
U5 United States Steel Co.

V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Steel Co.

W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W. Va. Steel & Mfg. Co.
W8 West.Auto.Mach.Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div. International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.

Y1 Youngstown Sheet&Tube

"Our Country's Strength is Created..."

REESE H. TAYLOR
President, Union Oil Company of California

"Our country's strength is created by the responsibility and solidarity of individual citizens in a self-chosen government and economy. It can—and must—be perpetuated against all who seek to undermine it. The men and women who invest regularly in United States Defense Bonds are contributing to our national integrity and to the traditions of personal independence so characteristic of a free people."

Every pay day, 6,500,000 employed men and women . . . "are contributing to our national integrity and to the tradition of personal independence . . ." by the systematic purchase of United States Defense Bonds.

How important is this contribution to national economy and personal security? Let's look at a few figures.

- the cumulative purchases of 6,500,000 Payroll Savers add up to $130,000,000 per month.
- the number of individual E Bonds sold in 1951 totaled 68,069,000 pieces—8% more than in 1950.
- purchases of $25 and $50 E Bonds—the denominations popular with Payroll Savers—were greater than the sales of $500 and $1,000 E Bonds.
- monthly redemptions of unmatured E Bonds during each of 9 months (April to December, 1951) were less than 1% of the amounts outstanding.
- the *cash value* of Series E Bonds held by individuals on December 31, 1951, amounted to $34,727,000,000—$4.8 billions more than the cash value of Series E's outstanding in August, 1945.

That Americans have built personal security and a reservoir of purchasing power exceeding $34.7 billions is due in no small measure to the patriotism and foresight of men like Mr. Taylor and other leaders of industry who have made the Payroll Savings Plan available to their employees.

For help with your Payroll Savings Plan, phone, wire or write to Savings Bond Division, U.S. Treasury Department, Suite 700, Washington Building, Washington, D. C.

The U.S. Government does not pay for this advertising. The Treasury Department thanks, for their patriotic donation, the Advertising Council and

STEEL

The Weekly Magazine of Metalworking

STANDARD PIPE, T & C

BUTTWELD Size Inches	List Per Ft	Pounds Per Ft	Carload Discounts from List, % Black A	Black B	Black C	Galvanized D	Galvanized E	Galvanized F
⅛	5.5c	0.24	34.0	32.0	...	+0.5	+2.5	...
¼	6.0	0.42	28.5	26.5	...	+3.5	+5.5	...
⅜	9.0	0.57	23.5	21.5	...	+10.0	+12.0	...
½	8.5	0.85	36.0	34.0	35.0	12.0	10.0	11.0
¾	11.5	1.18	39.0	37.0	38.0	16.0	14.0	15.0
1	17.0	1.68	41.5	39.5	40.5	19.5	17.5	18.5
1¼	23.0	2.28	42.0	40.0	41.0	20.5	18.5	19.5
1½	27.5	2.78	42.5	40.5	41.5	21.5	19.5	20.5
2	37	3.68	43.0	41.0	42.0	22.0	20.0	21.0
2½	58.5	5.82	43.5	41.5	42.5	23.0	21.0	22.0
3	76.5	7.62	43.5	41.5	42.5	23.0	21.0	22.0

Column A: Etna, Pa. N2 and 36½% on 3½", 4"; Butler, Pa. ¼-⅜", F6; Benwood, W. Va., 3½ points lower on ½", 1½ points lower on ¼", and 2 points lower on ⅜", W10; Sharon, Pa. M6, 1 point higher on ⅛", 2 points lower on ¼" and ⅜"; Wheatland, Pa. W9, 2 points lower on ½", ⅝", ¾". Following make ½" and larger: Lorain, O. N3; Youngstown R2 and 36¼% on 3½" and 4"; Youngstown Y1; Aliquippa, Pa. J5; Fontana, Calif. K1 quotes 11½ points lower on ½" and larger continuous weld and 24% on 3½" and 4".
Columns B & E: Sparrows Point, Md. B2.
Columns C & F: Indiana Harbor, Ind., Y1; Alton, Ill., (Gary base) 2 points lower discount L1.
Column D: Butler, Pa. F6, ⅛-⅜"; Benwood, W. Va. W10, except plus 4% on ⅛", plus 6% on ¼", plus 13% on ⅜" and 15.5% on 3½", 4"; Sharon, Pa. M6, plus 2.5 on ⅛", 1 point lower on ½", ¾", 1½ points lower on 1" and 1¼", 2 points lower on 1½", 2", 2½" and 3"; Wheatland, Pa. W9, add 2 points on ⅜", ½", ⅝", 1 point lower on ¾" 2 points lower on 1", 1¼", 2". 1½ points lower on 1¼", 2½", 3". Etna, Pa. N2 and 15.5% on 3½", 4". Following quote only on ½" and larger: Lorain, O. N3; Youngstown R2, and 15½% on 3½" and 4"; Youngstown Y1, Aliquippa, Pa. J5 quotes 1 point lower on ¾", 2 points lower on 1", 1½", 2", 1½ points lower on 1¼", 2½" and 3".

SEAMLESS AND ELECTRIC WELD Size Inches	List Per Ft	Pounds Per Ft	Carload Discounts from List, % Seamless Black A	Seamless Galv. B	Elec. Weld Black C	Elec. Weld Galv. D
2	37.0c	3.68	29.5	8.0	29.5	8.0
2½	58.5	5.82	32.5	11.5	32.5	11.5
3	76.5	7.62	32.5	11.5	32.5	11.5
3½	92.0	9.20	34.5	13.5	34.5	13.5
4	$1.09	10.89	34.5	13.5	34.5	13.5
5	1.48	14.81	37.0	16.0	37.0	16.0
6	1.92	19.18	37.0	16.0	37.0	16.0

Column A: Aliquippa J5; Ambridge N2; Lorain N3; Youngstown Y1.
Column B: Aliquippa J5 quotes 1½ pts lower on 2", 1 pt lower on 2½-6-in.; Lorain N3; Youngstown Y1.
Columns C & D: Youngstown R2.

BOILER TUBES

Net base c.l. prices, dollars per 100 ft., mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. In.	B.W. Ga.	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.	Elec. Weld C.D.
1	13	13.45	16.47	15.36	15.36
1¼	13	16.09	19.71	15.61	18.19
1½	13	17.27	21.15	17.25	20.30
1¾	13	19.29	23.62	19.62	23.09
2	13	21.62	26.48	21.99	25.86
2¼	13	24.35	29.82	24.50	28.84
2¼	12	26.92	32.97	26.98	31.76
2½	12	29.65	36.32	29.57	34.76
2¾	12	32.11	39.33	31.33	36.84
3	12	34.00	41.64	32.89	38.70

CLAD STEELS

(Cents per pound)

Cladding Stainless	Plates — Carbon Base 10%	Plates — Carbon Base 20%	Strip — Cold-Rolled Carbon Base Both Sides 10%	Strip — Cold-Rolled Carbon Base Both Sides	Sheets — Carbon Base 10%	Sheets — Carbon Base 20%	Sheets — Cu Base Both Sides
302 ...	....	....	....	....	19.75	26.24–27.50	77.00
304 ...	25.00	29.50	....	....	24.50	27.50–27.77	77.00
309 ...	30.50	35.00	....	....	....	....	....
310 ...	36.50	41.00	....	....	....	....	144.00
316 ...	29.50	34.00	....	....	26.00	35.92–36.50	....
317 ...	34.50	39.00	....	....	....	....	....
318 ...	33.50	38.00	....	....	....	....	....
321 ...	26.50	31.00–32.00	....	....	23.00	33,00	111.00
347 ...	27.50	32.00	....	....	24.00	33.50–33.83	130.00
405 ...	21.25	27.75	....	....	....	....	....
410 ...	20.75	27.25	....	....	....	....	....
Nickel	33.55	45.15	41.00	54.00	....	....	....
Inconel	41.23	54.18	....	....	....	....	165.00
Monel	34.93	46.28	....	....	....	....	....
Copper*	....	....	23.70†	29.65†	....	....	....

* Deoxidized. † 20.20c for hot-rolled. ‡ 26.40c for hot-rolled. Production points for carbon base products: Stainless plates, sheet, Conshohocken, Pa. A3 and New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7 and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; nickel, copper-clad strip, Carnegie, Pa., S18. Production point for copper-base sheets is Carnegie, Pa. A13.

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS
(F.o.b. midwestern plants; per cent off list for less than case lots to consumers

6 in. and shorter:	
½-in. & smaller diam.	15
⅝-in. & ⅞-in.	18.5
1-in. and larger ...	17.5
Longer than 6 in.:	
All diams.	14
Lag bolts, all diams.:	
6 in and shorter ...	23
over 6 in. long	21
Ribbed Necked Carriage	18.5
Blank	34
Plow	34
Step, Elevator, Tap and Sleigh Shoe	21
Tire bolts	12
Boiler & Fitting-Up Bolts	31

NUTS

	Reg.	Hvy.
H.P. & C.P. Square:		
½-in. & smaller	15	15
⅝-in. & ⅞-in. .	12	6.5
1-in.-1½-in. ..	9	1
1⅝-in. & larger	7.5	1
H.P. Hex.:		
½-in. & smaller	26	22
⅝-in. & ⅞-in. .	16.5	6.5
1-in.-1½-in. ..	12	2
1⅝-in. & larger	8.5	2
C.P. Hex.:		
½-in. & smaller	26	22
⅝-in. & ⅞-in. .	23	17.5
1-in. & 1½-in.	19.5	12
1⅝-in. & larger	12	6.5

SEMIFINISHED NUTS
American Standard
(Per cent off list for less than case or keg quantities)

	Reg.	Hvy.
½-in. & smaller..	35	28.5
⅝-in. & ⅞-in. ..	29.5	22
1-in.-1½-in.	24	15
1⅝-in. & larger..	13	8.5
		Light
⅞-in. & smaller		35
1-in. to ⅝-in.		28.5
¾-in. to 1½-in.		26

STEEL STOVE BOLTS
(F.o.b. plant; per cent off list in packages)

Plain finish	43 & 10
Plated finishes	31 & 10

HEXAGON CAP SCREWS
(1020 steel; packaged: per cent off list)

6 in. or shorter:	
⅝-in. & smaller	42
¾-in. through 1 in. .	34
Longer than 6 in.:	
⅝-in. & smaller	26
¾-in. through 1 in. .	4

SQUARE HEAD SET SCREWS
(Packaged; per cent off list)

1 in. diam x 6 in. and shorter	38
1 in. and smaller diam. x over 6 in.	26

HEADLESS SET SCREWS
(Packaged; per cent off list)

No. 10 and smaller ...	35
¼-in. diam. & larger ..	16
N.F. thread, all diams.	10

RIVETS

F.o.b. midwestern plants
Structural ½-in., larger 7.85c
⅞-in. under ..... 36 off

WASHERS, WROUGHT

F.o.b. shipping point, to jobbers—List to list-plus-$1

FLUORSPAR

Metallurgical grade, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content 70%, $43; 60%, $40.
Imported, net ton, duty paid, metallurgical grade, $33-$35.

ELECTRODES

(Threaded, with nipples, unboxed f.o.b. plant)

GRAPHITE

Diam.	Length	Cents per lb
17,18,20	60,72	17.85
8 to 16	48,60,72	17.85
7	48,60	19.57
6	48,60	20.95

CARBON

35,40	110	8.03
30	65,84,110	8.03
24	72 to 104	8.03
17 to 20	34,90	8.03

STAINLESS STEEL

Type	Sheets	C.R. Strip	Bars Wire Structurals
301...	41.00	34.00	31.25
302...	41.25	36.75	31.50
303...	43.25	40.25	34.00
304...	43.25	38.75	33.00
309...	56.00	55.00	44.75
316...	57.00	59.00	49.25
321...	49.25	48.25	37.00
347...	53.75	52.25	41.50
410...	36.50	30.50	25.75
416...	37.00	37.00	26.25
502...	28.50	27.00	15.25
420...	44.00	47.00	31.25
430...	39.00	31.00	26.25
501...	27.50	26.00	14.25

Balt., Types 301-347 sheet, except 303 and 309 E2.
Brackenridge, Pa., sheets A4 quotes slight variations on Types 301-347.
Bridgeville, Pa., bars, wire, sheets & strip U4.
Butler, Pa., sheets and strip except Types 303, 309, 416, 420, 501 & 502, A10.
Carnegie, Pa., sheets and strip except Types 303, 416, 501 & 502 S18.
Cleveland, strip A7.
Detroit, strip M1 quotes 34.00c on Type 301; 36.50c, 302; 38.50c, 304; 58.50c, 316; 52.00c, 347; 30.50c, 410; 31.00c, 430.
Dunkirk, N. Y., bars, wire A4 quotes slight variations on Types 301-347.
Duquesne, Pa., bars U5.
Fort Wayne, Ind., bars and wire, except Types 501 & 502 J6 quotes slight variations on Types 301-347.
Gary, Ind., sheets except Type 416 U5.
Harrison, N. J., strip and wire C18.
Massillon, O., all items, R2.
McKeesport, Pa., strip, Type 410; bars & wire, Types 410 through 430 and 31.25c on Type 302, 33.75c on 303, 32.75c on 304, 48.75c on 316, 36.75c on 321, 41.25c on 347 F2.
McKeesport, Pa., bars, sheets except Type 416 U5.
Middletown, O., sheets and strip except Types 303, 416, 420, 501 and 502 A10.
Midland, sheets & strip C18.
Munhall, Pa., bars U5.
Muncie, Ind., wire I-7 quotes types 302, 304, 430.
Pittsburgh, sheets C18.
Reading, Pa., strip except 34.25c on Type 301 and 56.00c on 309; bars, except 31.50c on Type 301 and 45.25c on 309 C4.
Sharon, Pa., strip, except Types 303, 309, 416, 501, 502 and 34.25c on Type 301 S3.
So. Chicago, Ill., bars & structurals U5.
Syracuse, N. Y., bars, wire & structurals C18.
Titusville, Pa., bars U4.
Wallingford, Conn., strip W2 quotes 0.25c higher.
Washington, Pa., bars, sheets & strip, except 0.25c higher on Type 301 J3.
Washington, Pa., Types 301 through 347 sheets & strip except 303, 309; 316 sheets 62.00c, strip 64.00c W4.
Watervliet, N. Y., structurals & bars A4 quotes variations on Types 301-347.
Waukegan, bars & wire A7.
West Leechburg, Pa., strip, A4 quotes slight variations on Types 301-347.
Youngstown, strip except Types 303, 309, 316, 416, 501 and 502 and 34.25c on Type 301 C8.

COAL CHEMICALS

Spot, cents per gallon, ovens
Pure benzol 30.00-35.00
Toluol, one deg...26.00-33.00
Industrial xylol ..25.00-33.50

Per ton bulk ovens
Sulphate of ammonia.$32-$45
Cents per pound, ovens
Phenol, 40 (carlots, non-returnable drums) ...17.25

METAL POWDERS

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh, except as otherwise noted.)

Sponge iron	Cents
98+% Fe, carlots..	17.00
Swedish, c.i.f. New York, in bags.	8.85-9.95
Electrolytic iron:	
Annealed, 99.5% Fe.	42.50
Unannealed (99 + % Fe)	36.50
Unannealed, 99 + % Fe (minus 325 mesh)	53.50
Powder Flakes	48.50
Carbonyl Iron: 97.9-99.8% size 5 to 10 microns ..	83.00-148.00
Aluminum:	
Carlots, freight allowed	29.50
Atomized, 500 lb drums, freight allowed	32.50
Antimony	75.85
Brass, 20-ton lots.	30.00-33.25
Bronze, 10-ton lots	51.25-60.00
Phosphor - Copper, 20-ton lots	50.00
Copper:	
Electrolytic	37.25
Reduced	33.75
Lead	26.30
Magnesium	75.00-85.00
Manganese:	
Minus 100 mesh	57.00
Minus 35 mesh	52.00
Minus 200 mesh	62.00
Nickel unannealed	86.00
Nickel-Silver 5-ton lots	45.00
Silicon	38.50
Solder (plus cost of metal)	8.50
Stainless Steel, 302 ...	83.00
Zinc, 10-ton lots.	25.00-32.50
Tungsten	Dollars
Melting grade, 99% 60 to 200 mesh:	
1000 lb and over....	6.00
Less than 1000 lb ..	6.15
98.8% minus 65 mesh:	
1000 lb and over....	4.15
Less than 1000 lb ..	4.25
Molybdenum: 99.9%, minus 200 mesh	3.24
Chromium, electrolytic 99% Cr min.	3.50

METALLURGICAL COKE

Price net ton

BEEHIVE OVENS

Connellsvil.fur.	$14.50-15.00
Connellsvil.fdy.	17.00-18.00
New River foundry...	21.30
Wise county, foundry..	15.95
Wise county, furnace..	15.20

OVEN FOUNDRY COKE

Kearney, N. J. ovens.	$22.75
Everett, Mass., ovens New England, del...	*24.80
Chicago ovens	23.00
Chicago, del.	24.50
Terre Haute, ovens....	22.50
Milwaukee, ovens	23.75
Indianapolis, ovens ...	22.75
Chicago, del.	26.42
Cincinnati, del.	25.85
Detroit, del.	26.85
Ironton, O., ovens	22.50
Cincinnati, del.	25.12
Painesville, O., ovens.	24.00
Cleveland, del.	25.82
Erie, Pa., ovens	23.50
Birmingham, ovens ..	20.30
Birmingham, del. ...	21.60
Philadelphia, ovens ...	22.70
NevilleIsland,Pa.,ovens	23.00
Swedeland, Pa., ovens.	22.60
St. Louis, ovens St. Louis, del.	25.40
Portsmouth, O., ovens	22.50
Cincinnati, del.	25.12
Detroit, ovens	24.00
Detroit, del.	25.00
Buffalo, del.	26.89
Flint, del.	26.59
Pontiac, del.	25.47
Saginaw, del.	26.92

* Or within $4.55 freight zone from works.

This is the way to pick up steel!

If it's **tool, alloy,** or **stainless** steel you're after, this is the way to get it: Pick up your phone and call your nearest Carpenter MILL-BRANCH WAREHOUSE or Distributor.

In a minute you're a *part* of Carpenter's direct-from-Mill WAREHOUSE set-up. And that makes a big difference to you. It means a wider choice of sizes and grades because all stocks in your Carpenter Warehouses are backed by the production flexibility of the specialty Mill in Reading. Every time you call you benefit from not only one warehouse but a *pool* of MILL-BRANCH WAREHOUSES—backed by all the know-how and facilities of the Reading Mill.

It means more complete service . . . more helpful and more authoritative information whenever you request it. Think how this *first-hand* source of service can assist you in smoothing-out tooling and production kinks!

It's almost like having a specialty steel Mill *right next door!*

Steel, information on prices, sizes and grades, engineering data, personal "in-your-shop" assistance—here's what you want in steel service! To get it, just pick up your phone and call your nearest Carpenter MILL-BRANCH WAREHOUSE or Distributor. The Carpenter Steel Co., 139 W. Bern St., Reading, Pa.

DON'T WAIT—COOPERATE!
The U.S. Needs Your Steel Scrap, Now

CALL Carpenter
for Mill-Branch Warehouse Service

SPECIALTY TOOL • ALLOY • AND • STAINLESS STEELS

WAREHOUSE STEEL PRODUCTS

(Representative prices, cents per pound, for delivery within switching limits, subject to extras.)

	SHEETS			STRIP		BARS			Standard Structural Shapes	PLATES	
	H.R. 18 Ga., Heavier*	C.R.	Gal. 10 Ga.†	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.	H.R. Alloy 4140‡§		Carbon	Floor
New York (city)	6.28	7.24	8.42	6.50	...	6.52	7.33	9.29	6.38	6.76	8.01
JerseyCity(c'try)	6.09	6.94	8.12	6.36	...	6.22	7.03	8.99	6.08	6.46	7.71
Boston (city) ..	6.40	7.20	8.51	6.32	...	6.25	7.24	10.80	6.40	6.60	7.84
Boston (c'try)..	6.20	7.00	8.31	6.12	...	6.05	7.04	10.60	6.20	6.40	7.64
Phila. (city) ...	6.04	6.97	8.35	6.29	7.11	6.29	7.16	10.48	6.10	6.38	7.29
Phila. (c'try) ..	5.79	6.72	8.10	6.04	6.86	6.04	6.91	10.23	5.85	6.13	7.04
Balt. (city) ...	5.74	7.00	8.40	6.23	...	6.21	6.83	...	6.33	6.33	7.57
Balt. (c'try) ..	5.54	6.80	8.20	6.03	...	6.01	6.63	...	6.13	6.13	7.37
Norfolk, Va. ...	6.78	...	...	...	...	6.04	7.30	...	6.30	6.30	7.15
Richmond, Va. .	5.74	6.57	8.38	6.14	...	5.91	6.59	...	6.72	6.86	8.00
Wash. (w'hse) .	6.05	7.26	8.49	6.50	...	6.50	7.26	...	6.60	6.65	7.86
Buffalo (del.)..	5.74	6.52	8.46	6.06	...	5.72	6.65	10.72††	6.02	6.18	7.55
Buffalo (w'hse).	5.54	6.32	8.26	5.86	...	5.52	6.45	10.52††	5.82	5.98	7.35
Pitts. (w'hse)..	5.54	6.32	8.25	5.84	6.90	5.47	6.40	10.10††	5.65	5.70	6.69
Detroit (w'hse).	5.74	6.49	8.55	5.78	7.15	5.76	6.60	10.37††	6.12	6.17	7.23
Cleveland (del.)	5.74	6.52	8.01	5.85	7.14	5.81	6.60	10.41††	6.18	6.02	7.43
Cleve. (w'hse) .	5.54	6.32	7.81	5.65	6.94	5.61	6.40	10.21††	5.98	5.82	7.23
Cincin. (w'hse).	5.87	6.39	8.32	5.79	...	5.77	6.66	10.52††	6.12	6.17	7.31
Chicago (city)..	5.74	6.52	8.05	5.69	...	5.67	6.50	10.30††	5.85	5.90	7.09
Chicago (w'hse)	5.54	6.32	7.85	5.49	...	5.47	6.30	10.10††	5.65	5.70	6.89
Milwau. (city) .	5.91	...	8.22	5.86	...	5.84	6.77	10.37††	6.02	6.07	7.26
Milwau. (c'try).	5.71	...	8.02	5.66	...	5.64	6.57	10.17††	5.82	5.87	7.06
St. Louis (del.)	6.04	6.82	8.35	5.99	...	5.97	6.90	10.60††	6.25	6.30	7.49
St. L. (w'hse) .	5.84	6.62	8.15	5.79	...	5.77	6.70	10.40††	6.05	6.10	7.29
Kans. City(city)	6.40	7.20	8.40	6.35	...	6.35	7.20	...	6.50	6.60	7.80
Kans.Cty(w'hse)	6.20	7.00	8.20	6.15	...	6.15	7.00	...	6.30	6.40	7.60
Birm'hm (city).	5.75	6.55	6.90[2]	5.70	...	5.70	7.53	...	5.85	6.10	8.23
Birm'hm(w'hse)	5.60	6.40	6.75[2]	5.55	...	5.55	7.53	...	5.70	5.95	8.23
Los Ang. (city).	6.50	8.30[3]	9.50	6.60	10.65	6.45	8.35	11.50††	6.50	6.50	8.75
L. A. (w'hse)..	6.30	8.10[3]	9.30	6.40	10.45	6.25	8.15	11.30††	6.30	6.30	8.55
Seattle-Tacoma.	7.01	9.18	9.65	7.55	...	6.80	9.14	10.35	6.57	6.95	8.73
SanFran.(w'hse)	6.44	7.88[3]	9.25[3]	6.45	...	6.41	8.20	11.30	6.25	6.38	8.45

* Prices do not include gage extras; † prices include gage and coating extras, except Birmingham (coating extra excluded) and Los Angeles (gage extra excluded); ‡ includes extra for 10 gage; § as rolled; ** 16 gage; †† as annealed; §§ 15 gage. Base quantities, 2000 to 9999 lb except as noted. Cold-rolled strip, 2000 lb and over; cold-finished bars, 2000 lb and over; [2]—500 to 1499 lb; [3]—450 to 1499 lb; [4]—3500 lb and over; [5]—1000 to 1999 lb.

Ores

Lake Superior Iron Ore
(1951 contract prices; 1952 prices not established)

Gross ton, 51½% (natural), lower lake ports. After adjustment for analysis, prices will be increased or decreased as the case may be for increases or decreases after Dec. 2, 1950, in applicable lake vessel rates, upper lake rail, freights, dock handling charges and taxes thereon.

Old range bessemer	$8.70
Old range nonbessemer	8.55
Mesabi bessemer	8.45
Mesabi nonbessemer	8.30
High phosphorus	8.30

Eastern Local Ore
Cents per unit del., E. Pa.

Foundry and basic 56-62% concentrates contract	17.00

Foreign Ore
Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60 to 68%:	
Spot	nom.
Long-term contract	20.00-24.00
North African hematites (spot)	26.00-28.00
Brazilian iron ore, 68-69% (spot)—	30.00-31.00

Tungsten Ore
Net ton unit, duty paid

Foreign wolframite and scheelite, per net ton unit	$65.00
Domestic scheelite mines	65.00

Manganese Ore

Manganese, 48% nearby, $1.18-1.22 per long ton unit, c.i.f. U. S. ports, duty for buyer's account; shipments against old contracts for 48% ore are being received from some sources at 85c-87c.

Chrome Ore

Gross ton, f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., or Tacoma, Wash.

Indian and African	
48% 2.8:1	$39.00-42.00
48% 3:1	44.00-45.00
48% no ratio	30.00-32.00
South African Transvaal	
44% no ratio	$27.00-28.00
48% no ratio	34.00-35.00
Brazilian	
44% 25:1 lump	nom.
Rhodesian	
45% no ratio	$29.00
48% no ratio	31.50-32.00
48% 3:1 lump	50.00-51.00
Domestic—rail nearest seller	
48% 3:1	$39.00

Molybdenum

Sulphide concentrates per lb, molybdenum content, mines	$1.00

REFRACTORIES

(Ceiling prices, effective Feb. 12, 1952, per 1000 units)

Fire Clay Brick

High-Heat Duty: Pueblo, Colo., $85; Ashland, Grahn, Hayward, Hitchins, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lochhaven, Lumber, Orviston, West Decatur, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parral, Portsmouth, O., Ottawa, Ill., Stevens Pottery, Ga., Woodbridge, N. J., $94.60; Salina, O., $99.60; Niles, O., $104; Los Angeles, Pittsburg, Calif., $126.

Silica Brick

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Portsmouth, O., $94.60; Hays, Pa., $100.10; Niles, O., $102; E. Chicago, Ind., Joliet, Rockdale, Ill., $104.50; Cutler, Utah, $111; Los Angeles, $117.

Insulating Fire Brick

2300° *F:* Massillon, O., $170; Clearfield, Pa., $171; Augusta, Ga., Beaver Falls, Zelienople, Pa., Mexico, Mo., $178.

Ladle Brick

Dry Pressed: Bessemer, Ala., $61.60; Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Pa., Wellsville, O., $66; Mexico, Mo., $70; Clearfield, Pa., Portsmouth, O., $79.20; Perla, Ark., $88; Los Angeles, $105; Pittsburg, Calif., $106.

Sleeves

Reesdale, Pa., $121; Johnstown, Pa., $121.30; Clearfield, Pa., $128.70; St. Louis, $131.45; Athens, Tex., $134.20.

Nozzles

Reesdale, Pa., $193.60; Johnstown, Pa., $198.55; Clearfield, Pa., $209; St. Louis, $213.95; Athens, Tex., $214.50.

Runners

Reesdale, Pa., $150.70; Johnstown, Pa., $154; Clearfield, Pa., $160; St. Louis, $162.25; Athens, Tex., $166.10.

High-Alumina Brick

50 *Per Cent:* Clearfield, Pa., St. Louis, Mexico, Mo., $158.40; Danville, Ill., $161.40.
60 *Per cent:* St. Louis, Mexico, Vandalia, Mo., $200.20; Danville, Ill., $203.20.
70 *Per cent:* St. Louis, Mexico, Vandalia, Mo., $233.20; Danville, Ill., $236.20; Clearfield, Pa., $240.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Contract, carload, lump, bulk 20.0c per lb of alloy, carload packed 20.8c, ton lot 22.3c, less ton 23.3c. Delivered. Spot add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Contract, carload, lump, bulk 10.0c per lb of alloy, carload packed 20.2c, ton lot 22.1c, less ton 23.6c. Deld. Spot add 0.25c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 30-43%, Fe 40-45%, C 0.20% max.). Contract, c.l. lump, bulk 7.0c per lb of alloy, c.l. packed 7.75c, ton lot 8.5c, less ton 9.35c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max.). Contract, carload, lump, packed 20.25c per lb of alloy, ton lot 21c, less ton 22.25c. Freight allowed. Spot add 0.25c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3¾ lb each and containing exactly 2 lb of Cr). Contract, carload, bulk, 14.50c per lb of briquet, carload packed 15.2c, ton 16.0c, less ton 16.9c. Deld. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Contract, carload, bulk 10.95c per lb of briquet, c.l. packaged 11.75c, ton lot 12.55c, less ton 13.45c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si). Contract, c.l. bulk 11.15c, per lb of briquet, c.l. packed 11.95c, ton lot 12.75c, less ton 13.65c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size — weighing approx. 5 lb and containing exactly 2 lb of Si). Contract, carload, bulk 6.95c per lb of briquet, c.l. packed 7.75c, ton lot 8.85c, less ton 9.45c. Delivered. Spot, add 0.25c.

(Small size—weighing approx. 2½ lb and containing exactly 1 lb of Si). Carload, bulk 7.1c, c.l. packed 7.9c, ton lot 8.7c, less ton 9.6c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each) $1.14 per pound of Mo contained, f.o.b. Langeloth, Pa.

NOTE: For current quotations on manganese, titanium and "other" ferroalloys, see page 203, June 16 issue; for chromium, silicon, vanadium, boron, tungsten alloys, page 163, June 9 issue.

CEILING PRICES, IRON AND STEEL SCRAP

Prices as set forth in Office of Price Stabilization ceiling price regulation No. 5, as amended Feb. 5, 1952.

STEELMAKING SCRAP COMPOSITE

June 19	$43.00
June 12	43.00
May 1952	43.00
June, 1951	44.00
June, 1947	32.48

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

Basing point ceiling prices per gross ton from which maximum shipping prices are computed on scrap of dealer and industrial origin; and from which ceiling on-line and ceiling delivered prices are computed on scrap of railroad origin.

Basing Point	No. 1 Bundles Dealer, Industrial	No. 1 Heavy Melt Railroad
Alabama City, Ala.	$39.00	$41.00
Ashland, Ky.	42.00	44.00
Atlanta, Ga.	39.00	41.00
Bethlehem, Pa.	42.00	44.00
Birmingham, Ala.	39.00	41.00
Brackenridge, Pa.	44.00	46.00
Buffalo, N. Y.	43.00	45.00
Butler, Pa.	44.00	46.00
Canton, O.	44.00	46.00
Chicago, Ill.	42.50	44.50
Cincinnati, O.	43.00	45.00
Claymont, Del.	42.50	44.50
Cleveland, O.	43.00	45.00
Coatesville, Pa.	42.50	44.50
Conshohocken, Pa.	42.50	44.50
Detroit, Mich.	41.15	43.15
Duluth, Minn.	40.00	42.00
Harrisburg, Pa.	42.50	44.50
Houston, Tex.	37.00	39.00
Johnstown, Pa.	44.00	46.00
Kansas City, Mo.	39.50	41.50
Kokomo, Ind.	42.00	44.00
Los Angeles	35.00	37.00
Middletown, O.	43.00	45.00
Midland, Pa.	44.00	46.00
Minnequa, Colo.	38.00	40.00
Monessen, Pa.	44.00	46.00
Phoenixville, Pa.	42.50	44.50
Pittsburg, Calif.	35.00	37.00
Pittsburgh, Pa.	44.00	46.00
Portland, Oreg.	35.00	37.00
Portsmouth, O.	42.00	44.00
St. Louis, Mo.	41.00	43.00
San Francisco	35.00	37.00
Seattle, Wash.	35.00	37.00
Sharon, Pa.	44.00	46.00
Sparrows Pt., Md.	42.00	44.00
Steubenville, O.	44.00	46.00
Warren, O.	44.00	46.00
Weirton, W. Va.	44.00	46.00
Youngstown, O.	44.00	46.00

Differentials from Base

Differentials per gross ton for other grades of dealer and industrial scrap:

O-H and Blast Furnace Grades

2. No. 1 Busheling	Base
3. No. 1 Heavy Melting	—$1.00
4. No. 2 Heavy Melting	— 1.00
5. No. 2 Bundles	— 1.00
6. Machine Shop Turnings	—10.00
7. Mixed Borings and Short Turnings	— 6.00
8. Shoveling Turnings	— 6.00
9. No. 2 Busheling	— 4.00
10. Cast Iron Borings	— 6.00

Elec. Furnace and Fdry. Grades

11. Billet, Bloom & Forge Crops	+ 7.50
12. Bar Crops & Plate	+ 5.00
13. Cast Steel	+ 5.00
14. Punchings & Plate Scrap	+ 2.50
15. Electric Furnace Bundles	+ 2.00
Cut Structurals & Plate:	
16. 3 feet and under	+ 3.00
17. 2 feet and under	+ 5.00
18. 1 foot and under	+ 6.00
19. Briquetted Cast Iron Borings	Base
Foundry, Steel:	
20. 2 feet and under	Base
21. 1 foot and under	+ 2.00
22. Springs and Crankshafts	+ 1.00
23. Alloy Free Turnings	— 3.00
24. Heavy Turnings	— 1.00
25. Briquetted Turnings	Base
26. No. 1 Chemical Borings	— 3.00
27. No. 2 Chemical Borings	— 4.00
28. Wrought Iron	+10.00
29. Shafting	+10.00
31. Old Tin & Terne Plated Bundles	—10.00

Unprepared Grades

When compressed constitutes:

32. No. 1 Bundles	— 6.00
33. No. 2 Bundles	— 9.00
34. Other than matherial suitable for hydraulic compression	— 8.00

Restrictions on Use

(1) Prices for Grades 11 and 23 may be charged only when shipped to a consumer directly from an industrial producer; otherwise ceiling prices shall not exceed prices established for Grades 12 and 8, respectively.

(2) Prices established for Grades 26 and 27 may be charged only when sold for use for chemical or annealing purposes, and in the case of Grade 27, for briquetting and direct charge into an electric furnace; otherwise ceiling prices shall not exceed price established for Grade 10.

(3) Prices established for Grade 28 may be charged only when sold to a producer of wrought iron; otherwise ceiling price shall not exceed ceiling price for corresponding grade of basic open-hearth.

(4) Premiums for Grades 11-18, 20 and 21 may be charged only when sold for use in electric and acid open-hearth furnaces or foundries; or in basic O-H or blast furnace under NPA allocation or OPS authorization.

(5) Prices for Grade 29 may be charged only when sold for forging or rerolling purpose.

Differentials from Base

Differentials per gross ton above or below the price of Grade 1 (No. 1 railroad heavy melting steel) for other grades of railroad steel scrap:

2. No. 2 Heavy Melting Steel	—$2.00
3. No. 2 Steel Wheel	Base
4. Hollow Bored Axles and loco. axles with keyways between the wheelseats.	Base
5. No. 1 Busheling	— 3.50
6. No. 1 Turnings	— 3.00
7. No. 2 Turnings, Drillings & Borings	—12.00
8. No. 2 Cast Steel and uncut wheelcenters	— 6.00
9. Uncut Frogs, Switches.	Base
10. Flues, Tubes & Pipes	— 8.00
11. Structural, Wrought Iron and/or/steel, uncut	— 6.00
12. Destroyed Steel Cars	— 8.00
13. No. 1 Sheet Scrap	— 9.50
14. Scrap Rails, Random Lengths	+ 2.00
15. Rerolling Rails	+ 7.00
Cut Rails:	
16. 3 feet and under	+ 5.00
17. 2 feet and under	+ 6.00
18. 18 inches and under	+ 8.00
19. Cast Steel, No. 1	+ 3.00
20. Uncut Tires	+ 2.00
21. Cut Tires	+ 5.00
Boilers & Side Frames:	
22. Uncut	Base
23. Cut	+ 3.00
24. Angles, Splice Bars & Tie Plates	+ 5.00
25. Solid Steel Axles	+12.00
26. Steel Wheels, No. 3 oversize	Base
27. Steel Wheels, No. 3	+ 5.00
28. Spring Steel	+ 5.00
29. Couplers & Knuckles	+ 5.00
30. Wrought Iron	+ 8.00
31. Fireboxes	— 8.00
32. Boilers	— 6.00
33. No. 2 Sheet Scrap	—13.00
34. Carsides, Doors, Car Ends, cut apart	— 6.00
35. Unassorted Iron & Steel	— 6.00
36. Unprepared scrap, not suitable for hydraulic compression	— 8.00

Restrictions on Use

(1) Price established for Grade 15 may be charged only when purchased and sold for rerolling uses; otherwise, ceiling shall not exceed that for Grade 14.

(2) Price established for Grade 30 may be charged only when sold to a producer of wrought iron; otherwise, ceiling shall not exceed that for No. 1 heavy melting steel.

(3) Price for Grade 25 may be charged only when sold for rerolling and forging purposes; otherwise, ceiling shall not exceed that for base grade (No. 1).

Preparation Charges

Ceiling fees per gross ton which may be charged for intransit preparation of any grade of steel scrap of dealer or industrial origin authorized by OPS are:

(1) For preparing into Grades No. 3, No. 4 or No. 2, $8.
(2) For hydraulically compressing Grade No. 1, $6 per ton; Grade No. 5, $8.
(3) For crushing Grade No. 6, $3.

For preparing into:

(4) Grade No. 25, $6.
(5) Grade No. 19, $6.
(6) Grades No. 12, No. 13, No. 14, No. 16, or No. 20, $10.
(7) Grade No. 17 or No. 21, $11.
(8) Grade No. 18, $12.
(9) For hydraulically compressing Grade No. 15, $8.
(10) For preparing into Grade No. 28, $10.

Ceiling fees per gross ton which may be charged for intransit preparation of any grade of steel scrap of railroad origin shall be:

(1) For preparing into Grade No. 1 and Grade No. 2, $8.
(2) For hydraulically compressing Grade No. 13, $6.

For preparing into:

(3) Grade No. 16, $4.
(4) Grade No. 17, $5.
(5) Grade No. 18, $7.
(6) Grade No. 21, $4.
(7) Grade No. 23, $4.

Ceiling fees per gross ton which may be charged for intransit preparation of cast iron are limited to:

(1) For preparing Grade No. 8 into grade No. 7, $9.
(2) For preparing Grade No. 3 into Grade No. 11, $7.
(3) For preparing Grade No. 3 into Grade No. 1, $4.

Premium for Alloy Content

No premium may be charged for alloy content except: $1.25 per ton for each 0.25% of nickel where scrap contains not less than 1% and not over 5.25% nickel; $2 per ton for scrap containing not less than 0.15 per cent molybdenum and $3 for scrap containing not less than 0.65% molybdenum; for scrap containing not less than 10% manganese, $4 for scrap in sizes larger than 12 x 24 x 8 in., and $14 for scrap cut in that size or smaller (applicable only if scrap is sold for electric furnace uses or on NPA allocation); $1 for scrap conforming to SAE 52100.

CAST IRON SCRAP

Ceiling price per gross ton for following grades shall be f.o.b. shipping point:

Cast Iron:

1. No. 1 (Cupola)	$49.00
2. No. 2 (Charging Box)	47.00
3. No. 3 (Hvy. Breakable)	45.00
4. No. 4 (Burnt Cast)	41.00
5. Cast Iron Brake Shoes	41.00
6. Stove Plate	46.00
7. Clean Auto Cast	52.00
8. Unstripped Motor Blocks	43.00
9. Wheels, No. 1	47.00
10. Malleable	55.00
11. Drop Broken Machinery	52.00

Restrictions on Use

(1) Ceiling shipping point price which a basic open-hearth consumer may pay for No. 1 cast iron, clean auto cast, malleable or drop broken machinery cast shall be ceiling price for No. 2 charging box cast.

OPEN MARKET

Birmingham
(Delivered)

No. 1 cupola cast	$42.00
Stove plate	37.00
Charging box cast	39.00-40.00
Heavy breakable	36.00-37.00
Drop broken machinery	42.00-43.00
Unstripped motor blocks	35.00-36.00

Boston
(F.o.b. shipping point)

No. 1 cupola cast	34.00
Heavy breakable	32.00
Stove plate	32.00
Unstripped motor blocks	30.00

Buffalo
(Delivered)

No. 1 cupola cast	41.00-43.00
Machine shop turnings	28.00-29.00
Short shoveling turnings	32.00-33.00
Cast iron borings	31.00
Mixed borings, turnings	32.00-33.00

Chicago
(Delivered)

Machine shop turnings	30.50
Mixed borings, turnings	34.50
Shoveling turnings	34.50
Cast iron borings	34.50
No. 1 cupola cast	43.00-47.00
Charging box cast	39.00-41.00
Heavy breakable	36.00-38.00
Burnt cast	36.00-38.00
Cast iron brake shoes	40.00-41.00
Stove plate	36.00-41.00
Clean auto cast	43.00-45.00
Unstripped motor blocks	33.00-35.00
Malleable	48.00-50.00
Drop broken machinery	45.00-50.00

Cleveland
(Delivered)

No. 1 cupola cast	44.00

Detroit
(Brokers' buying prices; f.o.b. shipping point)

Machine shop turnings	24.00-25.00
No. 1 cupola cast	43.00-44.00
Heavy breakable	39.00
Clean auto cast	46.00-47.00
Unstripped motor blocks	36.00-37.00
Drop broken machinery	46.00-47.00
Stove plate	42.00-43.00
Charging box cast	43.00

New York
(Brokers' buying prices; delivered consumers' plants)

Cupola cast	38.00
Unstripped motor blocks	34.00

Philadelphia
(Delivered)

Short shoveling turnings	33.50
No. 1 cupola cast	38.00-39.00
Unstripped motor blocks	35.00
Heavy breakable	42.00
Machinery cast	43.00-44.00

Pittsburgh
(Delivered)

No. 1 cupola cast	46.00
Heavy breakable	45.00
Charging box cast	47.00

San Francisco
(Delivered)

No. 2 bundles	30.00
No. 1 cupola cast	41.00

Seattle
(F.o.b. shipping point)

No. 2 bundles	29.00
No. 1 cupola cast	44.00
Heavy breakable	40.00

St. Louis
(Delivered)

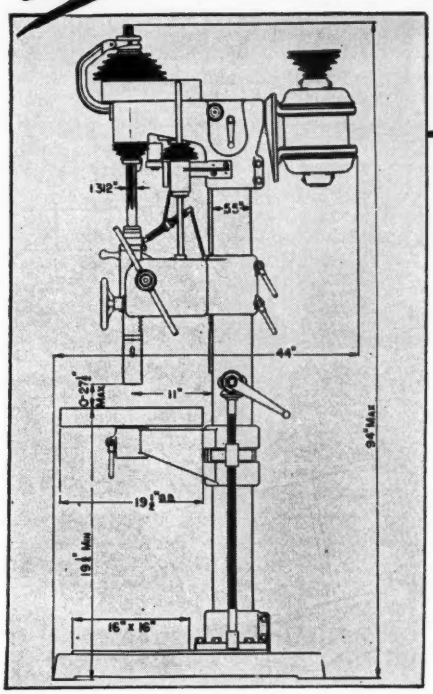
No. 1 cupola	41.00
Stove plate	39.00
Unstripped motor blocks	35.00

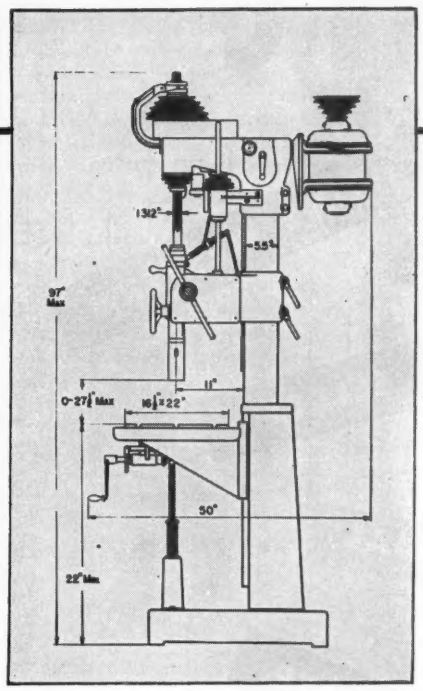
HAMILTON, ONT.
(Delivered Prices)

Heavy Melt.	$35.00
No. 1 Bundles	35.00
No. 2 Bundles	35.00
Mechanical Bundles	31.50
Mixed Steel Scrap	31.00
Mixed Borings, Turnings	32.00
Rails, Remelting	35.00
Rails, Rerolling	38.00
Busheling	29.50
Bushelings new factory: Prep'd	33.00
Unprep'd	31.00
Short Steel Turnings	32.00
Cast Iron Grades*	
No. 1 Machinery Cast	50.00

* F.O.B. shipping point.

See Why THIS DRILL CAN HANDLE Your Heaviest Jobs—





"Buffalo" No. 22 DRILL

• *Far Left,* (diagram) Overall Dimensions Of Round Column Model

• *Left,* (diagram) Overall Dimensions Of Pedestal Type Model

The dimension diagrams above show what this No. 22 Drill can do in your shop. It drills to the center of a 22" circle—adjusts from 0 to 27½" between working table and spindle nose—has a 5.5" steel column and a sturdy spindle that's 1.312" in least diameter. Here's a rugged, durable machine that will stand up under punishing schedules. Here's a machine to take large work pieces. And, as the diagrams show, controls and adjustment cranks are placed within easy reach of the operator—for minimum fatigue and maximum work flow. Also, construction is such that the overall height can be changed to meet special space requirements such as low ceiling. Available in one to four spindles with a wide variety of feeds and special attachments if desired.

WRITE FOR BULLETIN 2989-F.

"Buffalo" MACHINE TOOLS

BUFFALO FORGE COMPANY

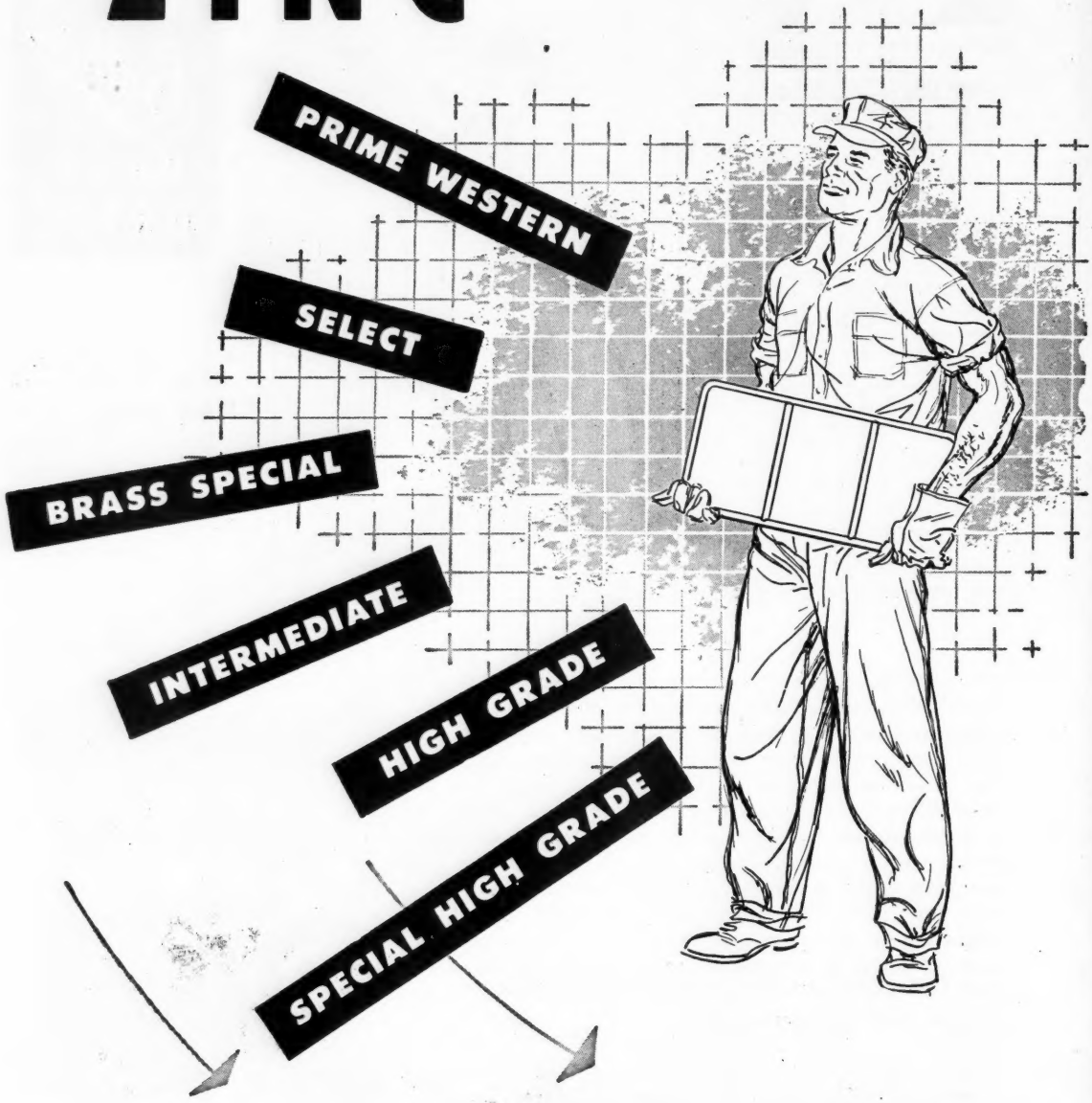
158 MORTIMER STREET BUFFALO, NEW YORK

Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

DRILLING PUNCHING SHEARING CUTTING BENDING

SLAB ZINC

every grade of ZINC
for urgent military and
civilian requirements



AMERICAN ZINC SALES COMPANY

Distributors for

AMERICAN ZINC, LEAD & SMELTING COMPANY

Columbus, O. Chicago St. Louis New York

Increase in allotments of copper, one of the most critically short metals, suggests that shortages in most nonferrous metals may be about over

LAND OF PLENTY—The U. S. is once more beginning to resemble this as far as metals are concerned. After a year and a half of pyramiding crises and critical shortages, the complex working of a normal market will seem remarkably simple.

Government control over metals is increasingly taking on the appearance, if not the name, of an open-end CMP. The raft of self-certifications, the over-allotments of plentiful materials, the easing restriction on use of even most-critical materials bear witness to this trend. If labor tumult subsides soon, industry could well be driving its own chariot soon.

Off Balance—The steel strike, to be sure, is relaxing urgency of immediate requirements for many nonferrous metals at the expense of long-term needs. A month's maneuverings in copper — see below — compounded confusion for fabricators of the red metal but brightened the future picture considerably by showing fabricators just where they stand.

Slackened production in various consumer durables lines has helped immeasurably in taking heat off suppliers and the government this year. Summer vacations coming up in force will give basic producers extra time to overtake demand.

Familiar Pattern—Operation of the old law of supply and demand will put industry fully back in business before too long. There'll be sufficient metal available for all defense needs, with enough left over for manufacturers to do with as they see fit. The extra materials are coming from expansion programs for primary metals that were started last year and the year before. The heyday of expansion hasn't passed either; right now it's at its zenith.

A look at capital expenditures for producing primary nonferrous metals shows that spending for new plant and equipment so far this year is well over twice that of last year's comparable period. This year will see about $500 million in plant-equipment outlays, compared with $277 million in 1951.

Stimulus for Copper

Sensing manufacturers using copper aren't overeager to use their "entitlements" to buy foreign copper at 36.5 cents, National Production Authority came up with an extra stimulus. During July, August and September fabricators can use an additional 50,000 tons of copper products. The NPA action is the first major government act to signify a break in copper supply is on its way.

Who gets the bonus metal? Consumer durables manufacturers will get a minimum of half of the copper products used in an average pre-Korean quarter. They now get 35 per cent of that amount. Makers of "nonessential" goods such as toys—now allowed about 25 per cent of their pre-Korea use—won't get the full increase. Manufacturers of defense-support products will share in the windfall, as will automakers and the construction industry. Doubt is still expressed that industry will buy all the foreign copper that has been made available, unless the price settles. Refined stocks outside the country have swelled recently.

Relief for Electroplaters

Electroplaters, long-suffering victims of a defense program that takes the lion's share of available nickel, will get partial relief from the restrictions of NPA order M-80, the alloying order. NPA is toying with the idea of permitting use of nickel as a "flash" undercoat prior to chrome plating items now on the verboten list for nickel use. First suggested was a maximum 0.0001-inch thickness for this use, considered impractical by many platers. The industry, which has seen its allocations double in the past year, feels the worst is over.

Tin Order To Be Eased

Relaxation of NPA order M-8, the tin order, is on its way. It will allow higher tin content in solder, allow use of limited amounts of tin in some 22 items in which it is prohibited, and increase allowance for items now restricted by the over-all 90 per cent use quota. The industry would like to see minimum deliveries of tin pipe without having to return an equivalent amount in tin content and use of 40 per cent tin content in solder without certification.

Uranium Mill, U.S.

The Scene: Inside an Atomic Energy Commission mill at Monticello, Utah. Here uranium oxide and vanadium oxide are extracted from ore. Galigher Co. of Salt Lake City operates the plant for AEC. Greatest known deposits of the metal are found in desolate country along the southern 200 miles of the Utah-Colorado border, in Indian country of northeast Arizona, northwest New Mexico

Little hope of returning tin to private buying is seen until the stockpile is built up further and supply lines to users are full. Imports this year are calculated at over 75,000 tons; industry uses about 60,000 tons of primary tin yearly. RFC intends to maintain its buying monopoly until there is no likelihood of a price runaway.

Aluminum Aplenty?

Lopping away at the aircraft building program in Congress means aluminum salesmen will be wearing out shoe leather sooner than expected. Only 15 per cent of total aluminum supply will be required at the peak of the program. Aircraft factories will be siphoning off an extra 500 tons monthly through 1953 for consumption and inventory buildup for the delivery peak in 1954. Estimates say aircraft industry consumption of aluminum will have dropped nearly one-half to about 11,000 tons by 1956. The gradual increase in aluminum requirements for aircraft thus won't materially affect the outlook for a comfortable supply this year.

NONFERROUS METALS

(Cents per pound, carlots, except as otherwise noted)

Primary Metals

Copper: Electrolytic 24.50c Conn. Valley Lake 24.62½c, delivered.

Brass Ingots: 85-5-5-5 (No. 115) 27.25c, 88-10-2 (No. 215) 40.00c; 80-10-10 (No. 305) 33.00c; No. 1 yellow (No. 405) 23.25c.

Zinc: Prime western 15.00c; brass special 15.25c; intermediate 15.50c, East St. Louis; high grade 16.35c, delivered.

Lead: Common 14.80c; chemical 14.90c; corroding 14.90c, St. Louis.

Primary Aluminum: 99% plus, ingots 19.00c, pigs 18.00c. Base prices for 10,000 lb and over. Freight allowed on 500 lb or more but not in excess of rate applicable on 30,000 lb c.l. orders.

Secondary Aluminum: Piston alloys 20.50c; No. 12 foundry alloy (No 2 grade) 19.50c; steel deoxidizing grades, notch bars, granulated or shot; Grade 1, 18.80c; grade 2, 18.60c; grade 3, 18.40c; grade 4, 18.20c.

Magnesium: Commercially pure (99.8%) standard ingots, 10,000 lb and over 24.50c, f.o.b Freeport, Tex.

Tin: Grade A, prompt 121.50c.

Antimony: American 99-99.8% and over but not meeting specifications below 39.00c; 99.8% and over (arsenic 0.05% max., other impurities 0.1% max.) 39.50c; f.o.b. Laredo, Tex., for bulk shipments.

Nickel: Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked, 56.50c; 25-lb pigs, 59.15c; "XX" nickel shot, 60.15c; "F" nickel shot or ingots, for addition to cast iron, 56.50c. Prices include import duty.

Mercury: Open market, spot, New York, $195-$200 per 76-lb flask.

Beryllium-Copper: 3.75-4.25% Be, $1.56 per lb of alloy, f.o.b. Reading, Pa.

Cadmium: "Regular" straight or flat forms, $2.25 del.; special or patented shapes $2.40.

Cobalt: 97.99%, $2.40 per lb for 500 lb (kegs); $2.42 per lb for 100 lb (case); $2.47 per lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.

Silver: Open market, New York 82.75c per oz.

Platinum: $90-$93 per ounce from refineries.

Palladium: $24 per troy ounce.

Iridium: $200 per troy ounce.

Titanium (sponge form): $5 per pound.

Rolled, Drawn, Extruded Products

COPPER AND BRASS

(Ceiling prices, cents per pound, f.o.b. mill, effective Aug. 23, 1951)

Sheet: Copper 41.68; yellow brass 38.28; commercial bronze, 95% 41.61; 90% 41.13; red brass, 85% 40.14; 80% 39.67; best quality, 39.15; nickel silver, 18%, 53.14; phosphor-bronze grade A, 5%, 61.07.

Rod: Copper, hot-rolled 37.53, cold-drawn 38.78; yellow brass free cutting,, 32.63; commercial bronze 95%, 41.30; 90% 40.82; red brass 85%, 39.83; 80%, 39.36.

Seamless Tubing: Copper 41.72; yellow brass 41.29; commercial bronze, 90%, 43.79; red brass, 85%, 43.05.

Wire: Yellow brass 38.57; commercial bronze, 95%, 41.90; 90%, 41.42; red brass, 85%, 40.43; 80%, 39.96; best quality brass, 39.44.

(Base prices, effective Dec. 26, 1951)

Copper Wire: Bare, soft, f.o.b. eastern mills, 100,000 lb lots, 28.545; 30,000 lb lots, 28.67; l.c.l., 29.17, Weatherproof, 100,000 lb, 30.35; 30,000 lb, 30.60; l.c.l., 31.10. Magnet wire del., 15,000 lb or more, 34.50; l.c.l., 35.25.

ALUMINUM

(30,000 lb base; freight allowed on 500 lb or more, but not in excess of rate applicable on 30,000 lb c.l. orders)

Sheets and Circles: 2s and 3s mill finish c.l.

Thickness Range Inches	Widths or Diameters, In., Inc.	Flat Sheet Base*	Coiled Sheet Base	Coiled Sheet Circle† Base
0.249-0.136	12-48	30.1	...	...
0.135-0.096	12-48	30.6	...	...
0.095-0.077	12-48	31.2	29.1	33.2
0.076-0.061	12-48	31.8	29.3	33.4
0.060-0.048	12-48	32.1	29.5	33.7
0.047-0.038	12-48	32.5	29.8	34.0
0.037-0.030	12-48	32.9	30.2	34.6
0.029-0.024	12-48	33.4	30.5	35.0
0.023-0.019	12-36	34.0	31.1	35.7
0.018-0.017	12-36	34.7	31.7	36.6
0.016-0.015	12-36	35.5	32.4	37.6
0.014	12-24	36.5	33.3	38.9
0.013-0.012	12-24	37.4	34.0	39.7
0.011	12-24	38.4	35.0	41.2
0.010-0.0095	12-24	39.4	36.1	42.7
0.009-0.0085	12-24	40.6	37.2	44.4
0.008-0.0075	12-24	41.9	38.4	46.1
0.007	12-18	43.3	39.7	48.2
0.006	12-18	44.8	41.0	52.8

* Lengths 72 to 180 inches. † Maximum diameter, 26 inches.

Screw Machine Stock: 5000 lb and over.

Dia. (in.) or distance across flats	—Round— R317-T4 17S-T4	R-317-T4	——Hexagonal—— 17S-T4
0.125	52.0	....	....
0.156-0.0188	44.0	....	....
0.219-0.313	41.5	....	....
0.375	40.0	46.0	48.0
0.406	40.0	....	....
0.438	40.0	46.0	48.0
0.469	40.0	....	....
0.500	40.0	46.0	48.0
0.531	40.0	....	....
0.563	40.0	....	45.0
0.594	40.0	....	....
0.625	40.0	43.5	45.0
0.688	40.0	....	45.0
0.750-1.000	39.0	41.0	42.5
1.063	39.0	....	41.0
1.125-1.500	37.5	39.5	41.0
1.563	37.0	....	....
1.625	36.5	....	39.5
1.688-2.000	36.5	....	....

LEAD

(Prices to jobbers f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets: Full rolls, 140 sq ft or more $20.00 per cwt; add 50c cwt 10 sq ft to 140 sq ft. Pipe: Full coils $20.00 per cwt. Traps and bends: List prices plus 50%.

ZINC

Sheets 23.75c, f.o.b. mill 36,000 lb and over. Ribbon zinc in coils, 22.25c, f.o.b. mill, 36,000 lb and over. Plates, not over 12-in., 23.50-23.75c; over 12-in., 23.50-23.75c.

"A" NICKEL

(Base prices f.o.b. mill)

Sheets, cold-rolled, 77.00c. Strip, cold-rolled, 83.00c. Rods and shapes, 73.00c. Plates, 75.00c. Seamless tubes, 106.00c.

MONEL

(Base prices f.o.b. mill)

Sheets, cold-rolled 60.50c. Strip, cold-rolled 63.50c. Rods and shapes, 58.50c. Plates, 59.50c. Seamless tubes, 93.50c. Shot and blocks, 53.50c.

MAGNESIUM

Extruded Rounds 12 in. long, 1.31 in. in diameter, less than 25 lb, 55.00-62.00c; 25 to 99 lb, 45.00-52.00c; 100 lb to 5000 lb, 41.00c.

TITANIUM

(Prices per lb 10,000 lb and over, f.o.b. mill) Sheets, $15; sheared mill plate, $12; strip, $15; wire, $10; forgings, $6; hot-rolled and forged bars, $6.

DAILY PRICE RECORD

1952	Copper	Lead	Zinc	Tin	Aluminum	Antimony	Nickel	Silver
June 18-19	24.50	14.80	15.00	121.50	19.00	39.00	56.50	82.75
June 5-17	24.50	14.80	16.00	121.50	19.00	39.00	56.50	82.75
June 2-4	24.50	14.80	17.50	121.50	19.00	39.00	56.50	82.75
May 28-31	24.50	14.80	19.50	121.50	19.00	39.00	56.50	82.75
May 20-27	24.50	14.80	19.50	121.50	19.00	39.00	56.50	84.00
May 16-19	24.50	14.80	19.50	121.50	19.00	44.00	56.50	84.00
May 15	24.50	14.80	19.50	121.50	19.00	44.00	56.50	85.00
May 13-14	24.50	14.80	19.50	121.50	19.00	44.00	56.50	86.00
May 12	24.50	14.80	19.50	121.50	19.00	44.00	56.50	87.00
May 6-10	24.50	16.80	19.50	121.50	19.00	44.00	56.50	87.00
May Avg.	24.50	15.519	19.50	121.50	19.00	42.077	56.50	85.356
Apr. Avg.	24.50	18.723	19.50	121.50	19.00	49.077	56.50	88.00
Mar. Avg.	24.50	18.80	19.50	121.50	19.00	50.00	56.50	88.00
Feb. Avg.	24.50	18.80	19.50	121.50	19.00	50.00	56.50	88.00
Jan. Avg.	24.50	18.80	19.50	109.404	19.00	50.00	56.50	88.00

NOTE: Copper: Electrolytic, del. Conn. Valley; Lead, common grade, del. St. Louis; Zinc, prime western, E. St. Louis; Tin, Straits, del. New York; Aluminum primary ingots, 99%, del; Antimony, bulk, f.o.b. Laredo, Tex.; Nickel, electrolytic cathodes, 99.9%, base sizes at refinery unpacked. Silver, open market, New York. Prices, cents per pound; except silver, cents per ounce.

Plating Materials

Chromic Acid: 99.9% flakes, f.o.b. Philadelphia, carloads, 28.00c; 5 tons and over 28.50c; 1 to 5 tons, 29.00c; less than 1 ton 29.50c.

Copper Anodes: Base 2000 to 5000 lb; f.o.b. shipping point, freight allowed: Flat, rolled, 38.34c; oval 37.84c.

Nickel Anodes: Rolled oval, carbonized, carloads, 74,50c; 10,000 to 30,000 lb. 75.50c; 3000 to 10,000 lb. 76.50c; 500 to 3000 lb 77.50c; 100 to 500 lb, 79.50c; under 100 lb, 82.50c; f.o.b. Cleveland.

Nickel Chloride: 36.50c in 100 lb bags; 34.50c in lots of 400 lb through 10,000 lb; 34.00c over 10,000 lb, f.o.b. Cleveland, freight allowed on 400 lb or more.

Sodium Stannate: 25 lb cans only, less than 100 lb to consumers 86.7c; 100 or 350 lb drums only, 100 to 600 lb 71.60c; 700 to 1900 lb, 69c; 2000 to 9900 lb, 67.3c. Freight allowed east of Mississippi and north of Ohio and Potomac rivers.

Tin Anodes: Bar, 1000 lb and over, $1.375; 500 to 999 lb, $1.38; 200 to 499 lb, $1.385; less than 200 lb, $1.40. Freight allowed east of Mississippi and north of Ohio and Potomac.

Zinc Cyanide: 100 lb drums, less than 10 drums 54.30c, 10 or more drums, 52.30c, f.o.b. Niagara Falls, N. Y.

Stannous Sulphate: 100 lb kegs or 400 lb bbl, less than 2000 lb $1.11; more than 2000 lb, $1.09. Freight allowed east of Mississippi and north of Ohio and Potomac rivers.

Stannous Choride (Anhydrous): In 400 lb bbl, 98.5c; 100 lb kegs 99.5c. Freight allowed.

Scrap Metals

Brass Mill Allowances

Ceiling prices in cents per pound for less than 20,000 lb, f.o.b. shipping point, effective June 26, 1951.

	Clean Heavy	Rod Ends	Clean Turnings
Copper	21.50	21.50	20.75
Yellow Brass	19.125	18.875	17.875
Commercial Bronze			
95%	20.50	20.25	19.75
90%	20.50	20.25	19.75
Red Brass			
85%	20.25	20.00	19.375
80%	20.125	19.875	19.375
Muntz metal	18.125	17.875	17.375
Nickel silver, 10%	21.50	21.25	10.75
Phos. Bronze, 5%	25.25	25.00	24.00

Copper Scrap Ceiling Prices

(Base prices, cents per pound, less than 40,000 lb f.o.b. point of shipment)

Group 1: No. 1 copper 19.25; No. 2 copper wire and mixed heavy 17.75; light copper 16.50; No. 1 borings 19.25; No. 2 borings 17.75; refinery brass, 17.00 per lb of dry Cu content for 50 to 60 per cent material and 17.25 per lb for over 60 per cent material. Group II: No. 1 soft red brass solids 18.50; No. 1 composition borings 19.25 per lb of Cu content plus 63 cents per lb of tin content; mixed brass borings 19.25 per pound of Cu content plus 60 cents per lb of tin content; unlined red car boxes 18.25; lined red car boxes 17.25; cocks and faucets 16.00; mixed brass screens 16.00; zincy bronze solids and borings 16.25.

Aluminum Scrap Ceiling Prices

(Cents per pound, f.o.b. point of shipment, less than 5000 lb)

Segregated plant scrap: 2s solids, copper free, 10.50; high grade borings and turnings, 8.50; No. 12 piston borings and turnings, 7.50. Mixed plant scrap: Copper-free solids, 10.00; dural type, 9.00. Obsolete scrap: Pure old cable, 10,00; sheet and sheet utensils, 7.25; old castings and forgings, 7.75; clean pistons, free of struts, 7.75; pistons with struts, 5.75.

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

Lead: Heavy 11-00-11.25; battery plates 6.50-6.75; linotype and stereotype 12.50-13.00; electrotype 11.00-11.50; mixed babbitt 14.50-14.75.

SMELTERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

Zinc: Old zinc, 8.75; new die cast scrap, 8.50; old die cast scrap, 8.50.

Easier installation with "Quikupl" made possible a reduction of 40 to 50% in time and labor when this line was installed in Feb. 1951. Since then "Quikupl" has been completely tested to complete satisfaction. Place: Precision Film Laboratories, Inc. New York.

"QUIKUPL"®

STAINLESS STEEL FITTINGS

Now . . . you can join tubing or pipe without threading, flaring, sweat-soldering, brazing or welding. Simply use "Quikupl" . . . the *completely new . . . completely tested* stainless steel fitting.

"Quikupl" cuts labor and installation time. Lines already installed show time and labor can be reduced 40 to 50%—or more. Tubing or pipe is simply cut to length, deburred and inserted into the fitting. Tightening a small screw completes the coupling. A resilient sealing ring . . . nontoxic to foods, and resistant to most chemicals . . . provides initial squeeze fit between fitting and tube or pipe. The higher the pressure, the better the sealing effect.

"Quikupl" is a money saver. You can use Schedule 5, the lightest pipe made—or tubing with even a lighter wall. You pay less per foot because you buy only the wall thickness needed to do the job.

"Quikupl" couplings, tees, adapters and elbows (45° and 90°) are available from Frasse warehouse stock in Types 304 and 316 Stainless Steel—tube and pipe sizes range from 1" O.D. to 4" O.D.

Facts about "Quikupl" fittings and how you can save with them are outlined in Frasse Engineering Memorandum #7. Send for your copy today.

Call FRASSE 1st FOR STAINLESS STEEL

Bars • Sheets • Strip • Plates • Wire
Tubing • Pipe • Valves • Fittings

GET FACTS

Peter A. FRASSE and Co., Inc. 47J
17 Grand Street
New York 13, N. Y.

Gentlemen: Please send me your Engineering Memorandum #7 containing complete facts about "Quikupl" stainless steel fittings.

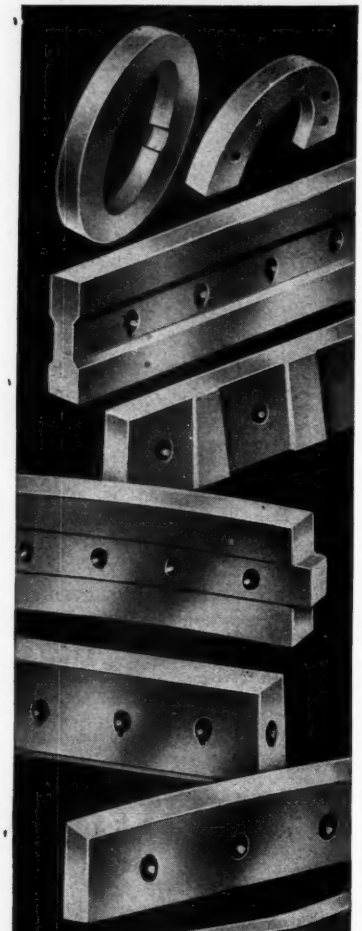
Name_____ Title_____

Firm_____

Address_____

Peter A. FRASSE and Co., Inc.

New York 13, N. Y. 17 Grand St. Walker 5-2200
Philadelphia 29, Pa. 3911 Wissahickon Ave. Baldwin 9-9900
Buffalo 3, N. Y. 50 Exchange St. Washington 2000
Syracuse 1, N. Y. P. O. Box 1267 Syracuse 73-5241
Lyndhurst • Hartford • Rochester • Baltimore



Sheets, Strip . . .

Sheet and Strip Prices, Page 147 & 148

Cleveland—Loss of sheet tonnage so far in the steel strike will necessitate some changes in third quarter scheduling to care for the larger carryover now indicated. Mills in this area were booked full for the July-September period prior to the walkout and there is little likelihood any open rolling time will be available over the summer after the mills resume. Some defense account inquiry for the period has been turned away. Books have not been opened for fourth quarter and will not be opened until scheduling prospects are possible of evaluating. Even military tonnage orders for this latter period are being held up pending clarification of the outlook. Surprisingly, the mills are not under much additional pressure from consumers for tonnage.

Boston—Narrow cold strip users manage to keep going with few curtailments despite the loss of tonnage from one large producer. Nonintegrated mills normally supplying substantial tonnage are operating, but the end is in sight for several with inventories down to two or three weeks. Already the range in sizes and grades has narrowed and all volume offered can not be accepted.

New York—Consumers of sheets are not as hard hit by the steel strike as those of other major products. Nevertheless, there is a growing disposition to pick up tonnage where available, as long as it is not at gray market prices. Most consumers are beginning to anticipate the time, perhaps in late summer or early fall, when there will be an actual stringency in hot and cold-rolled sheets, to say nothing of galvanized sheets, which have been in tight supply all along.

Philadelphia—Most district sheet consumers have enough tonnage on hand to last them over the remainder of this month, after which a number will suspend for mass vacations. There is no particular pressure on sellers for the time being. Consumers are not going outside the district to such mills as are still in operation, nor are they stepping up their demands on warehouses to any appreciable extent. However, they are increasingly concerned about fourth quarter, especially those users who lagged on their commitments for third quarter. Mills are not disposed to discuss fourth quarter tonnage until the strike is ended.

Pittsburgh—Rumors that automotive interests are seeking conversion tonnage are circulating here. A nonintegrated sheet producer which has done some conversion rolling in the past, however, is taking no tonnage over that already booked. It has turned down inquiries for substantial additional tonnage. Sheet buyers in the district expect cutbacks in third quarter allotments and some are said to have been told to expect only half their prestrike tonnage for fourth quarter.

Bids are in with U.S. Engineer, Pittsburgh, on four million square feet of steel airplane landing mat and two million square feet of aluminum landing mat.

Chicago—Because of the strike and the fact cold-rolled sheets were uncomfortably tight prior to the mill shutdown, renewed interest is developing in conversion deals. Carryovers for hot and cold-rolled sheets were sizable prior to the strike and it now appears fourth quarter schedules will provide little space for acceptance of new orders.

St. Louis—Sheet output is at a standstill here with Granite City Steel Co. closed by the strike.

Semifinished Steel . . .

Semifinished Prices, Page 147

Detroit — Electric furnace operations were scheduled to begin at Rotary Electric Steel Co. at midnight Thursday, with rolling mills getting into production on Friday. The union and company reached agreement on Wednesday.

Steel Bars . . .

Bar Prices, Page 147

Chicago—The only bar producer not strikebound in this district reports its output through July being tapped for diversion to the military program and direct defense. The fuze program figures heavily in this picture. Shipping schedules will be affected for a long period ahead, even to high-rated regular customers. Some bar consumers are arranging for conversion of axles into merchant and reinforcing bars after the strike ends. Cold-finishers are swamped with calls from users.

Boston—With mounting defense requirements getting first call on available tonnage, bar consumers confront shortages and curtailment of operations. Heavy set-asides for fourth quarter would have normally reduced civilian volume, and supply in various grades and sizes for armament may fall short of needs regardless of directives.

New York—Most bar consumers had only a limited tonnage in stock when the steel strike began and as a result of the continued tie-up at the mills are beginning to find their own operations disrupted. It is primarily now a matter of unbalanced stocks, with the larger sizes becoming increasingly scarce. Cold drawers are having to suspend operations on various lines because of inability to get hot stock; and that situation in turn is adding to the stringency in cold drawn steel, for which there has been a pressing demand for some time.

Philadelphia—Squeeze in hot carbon bars is becoming pronounced. Cold drawers are having to curtail operations. One district shop is suspending for two weeks beginning June 23. Employees' time off will be applied against vacations. Most forgers are nearing the point where curtailments will be necessary. The Pennsylvania & Reading is laying off shop and operating men, the shop men due to unbalanced steel inventories, including bars.

Pittsburgh—A much tighter fourth quarter bar supply situation than had been anticipated is rapidly shaping up as a result of the steel strike. At least a month's production in the period will be blanked out to compensate for the expected carryover from the third quarter. Since there will be little if any reduction in allot-

ments for direct military account, the bite into other rated programs may be even more than a month, depending on the length of the strike.

Cleveland—Bar shortage, intensified by the loss of tonnage resulting from the steel strike, promises to extend into next year. Some CMP tickkets for third quarter were seeking a home prior to the current walkout of steelworkers, and indications are a still greater number will be seeking homes in fourth quarter unless the strike is quickly terminated.

Wire . . .

Wire Prices, Page 149

Boston—Demand for wire has improved with those mills still producing. These include one integrated unit. Most converters are operating on rod inventories which are being depleted steadily. Many regular customers have increased original orders for this and next month, but all volume offered can not be accepted.

Plates . . .

Plate Prices, Page 147

Boston — Weldment shops have heavy backlogs, and, while plate inventories have maintained operations, some are now bordering on difficulty. Relatively large ratio of backlogs is for defense or armament producing equipment. Inventories have been nearly halved since steel production halted and once plate volume is resumed in volume, weldment shops look for early assistance for the most urgent work on books. Small tank operations are off slightly. Backlogs are lower and stocks of light plates still approximate 30 days. Boiler shops are lagging, but expected consumption of plates for shipbuilding, third quarter, may be difficult to attain. Fabricators will pay premium prices for special requirements needed to expedite important work, but are reluctant to pay higher costs for inventory material.

New York—Pressure for plates is being stepped up a bit. Where there seemed to be little extra demand during the first week to ten days of the steel strike, mills in operation—two along the eastern seaboard—now report livelier inquiry.

Philadelphia—Plate fabricators are maintaining operations, but the going is increasingly tough. Another two weeks may witness curtailments should the steel strike continue. Consumers are inquiring more actively for tonnage from mills still in operation, although moving slowly in paying high premiums.

Pittsburgh—Prestrike balance between light plate and sheet production on continuous hot mills rolling both items is expected to be maintained after the steel strike.

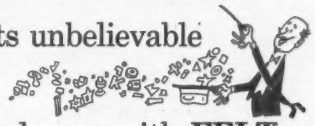
Chicago—Plate fabricators report enough steel on hand to continue operations two or three weeks. There will be fewer assemblies put in process and supplies will be switched from job to job to keep scheduled work progressing.

Seattle—Considerable work involving plates is pending but fabricators report decreased inquiry as buyers are postponing action, knowing that in the meantime it is impossible to obtain materials.

MATERIAL PROBLEM GOT YOU WORRIED?

Consider Felt—the Material that's Solved Thousands of Problems

FELT is known as "the Miracle Material of a Million Uses" because of its unbelievable variety of characteristics . . .



For instance, we can supply you with **FELT** as soft as a young girl's whisper

...or as tough and hard as a loan shark's heart.

We will make it for you in any color or shade in the full range

from black to white.

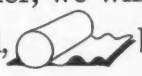
You can order it in any thickness, any consistency, any size,

any shape.

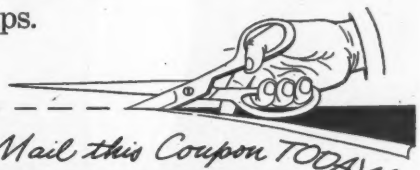
We will cut it for you to meet your most exacting

size-and-shape requirements.

Or, if you prefer, we will ship it to you by the roll,



by the square yard, or in strips.



Fill out and Mail this Coupon TODAY!

The FELTERS COMPANY

Manufacturers of Unisorb for Machine Mounting

210-Q SOUTH STREET, BOSTON 11, MASS.

Gentlemen: Please send me details on Felters Felt and Felters Precision Cut Felt Parts. I have the following material problem:

.....

.....

Name & Title.....

Company.....

Address.....

City & State.....

Structural Shapes . . .

Structural Shape Prices, Page 147

Philadelphia — Bridgework dominates the structural market with some sprinkling of ordnance work. There are virtually no commercial awards. Prolongation of the steel strike indicates no early easing in controls on commercial construction. Most fabricating shops have enough steel to provide fairly sustained operations for another two weeks. Certain shops will suspend completely rather than throw inventories completely out of balance should supply conditions worsen.

Boston—Structural fabricators are reluctant to pay premium prices for limited tonnage of plain material available.

For the last current contract, C-2a, 3650 tons for Fitzgerald Expressway superstructure, Boston, Bethlehem Steel Co., low, quoted 24.75c per pound on carbon structural steel for bents; 23.35c fabricated carbon steel for floor system and bracing, and 27.25c for fabricated silicon steel.

New York—Structural demand has received a setback as a result of Washington's action in cancelling plans for the further relaxing of building controls July 1.

Pittsburgh — Fabricators operating from four to six weeks' inventories believe current high-level operations are at the expense of future production. Although there are some exceptions, inventories generally are in good balance. Inquiries have picked up. Some orders were closed since relaxation of the government's ban on certain types of building but it now appears the restrictions may be reapplied if the steel strike is prolonged.

Seattle — Except for Bethlehem's local plant, fabricating shops are operating. Decreasing order backlogs and disappearing inventories are the immediate problems.

Pig Iron . . .

Pig Iron Prices, Page 146

New York—Pressure for iron continues light, as most foundries have fair inventories and, moreover, not only are operating slowly, but in many cases expect to close down for vacations for the first week or two in July. Those that are closing down as of the beginning of next month will probably hold up on all shipments beginning late in June. Foreign demand is pressing, from England, Italy and South America, in about that order. The latter includes 1000 tons of basic for Venezuela. A similar tonnage of basic also is pending for Ireland.

Boston—Pig iron foundry melt, 65 to 70 per cent of capacity, will slacken in July due to vacations. Pressure for iron has eased and of the major industries using castings only machine tools are holding near earlier levels.

Philadelphia—With various consumers of basic pig iron strikebound and with more foundries planning to suspend for mass vacations early next month, the movement of pig iron is expected to undergo further decline.

Pittsburgh—Some district foundries will be virtually out of pig iron by end of June. In several instances melts are being sustained by using greater percentage of scrap. Vacations beginning July will postpone critical hardships until about mid-month and some shops may find it difficult to resume full scale operations on scheduled reopening dates. Furnaces will not be able to make up consumer iron stock deficits for a long time, depending, of course, on length of the steel strike.

Cleveland — Approximately one month's production of pig iron has been lost by furnaces serving the merchant market in this area as result of the three steel industry work stoppages this spring. This means supply conditions will be tight through most of the remainder of the year even though the strike be terminated soon.

Chicago—A few foundries are becoming concerned lest they will not have enough pig iron to resume operations when scheduled vacation closings end in mid-July. Present stocks will carry until vacations start in early July. A small amount of Canadian iron found takers readily, but tonnage is small and no great amount will be available except on a spasmodic basis.

St. Louis—Pig iron production, devoted wholly to foundry and malleable, continues uninterrupted. Foundry demand has softened but is still strong enough that the two stacks here are unable to stockpile reserves.

Fasteners . . .

Bolt, Nut, Rivet Prices, Page 151

Pittsburgh—Not all CMP tickets for fasteners will be cashed in the next quarter. Even before the strike the inventory situation left a lot to be desired and those manufacturers still operating are chewing up their steel stocks without getting any replacement.

Iron Ore . . .

Iron Ore Prices, Page 153

Cleveland—Only a trickle of iron ore is flowing from the upper to lower lake ports, as the steel strike enters its third week. The gain in shipments over the like 1951 period, achieved during the early weeks of the season this year, has been washed out, leaving a deficit of 4,245,239 tons.

Shipments for the week ended June 16 amounted to only 161,043 tons compared with 3,125,969 tons in the week prior to the steel strike. This brought the season's accumulative total to 21,350,290 tons against 25,595,529 tons for the like period a year ago.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 151

Cleveland—Battery of 45 coke ovens at the Cleveland Works of American Steel & Wire Division, U. S. Steel Co., will be rebuilt, the work beginning July 27 and taking about four months for completion. The ovens produce about 500 tons of coke daily.

Scrap . . .

Scrap Prices, Page 154

Boston—There is scarcely enough business in cast and steel scrap to accurately establish prices.

New York—Scrap brokers' buying prices are unchanged pending completion of existing contracts. However, indications point to lower prices once new contracts are consummated.

Buffalo—Weaker prices rule in the scrap market with supplies continuing to back up in dealers' yards. An embargo on shipments to dealers is expected if the steel strike continues. Dealers reluctantly admit the future outlook is cloudy. Cast prices run $5 to $9 per ton below ceiling levels.

Philadelphia—Scrap demand is at low ebb. Alan Wood Steel Co., Conshohocken, Pa., one of the few mills in operation, has again held up shipments of open-hearth scrap and consumers of cast grades are taking in far less tonnage than is available. One district yard is closing down for mass vacations in advance of original schedule. The Birdsboro, Pa., consumer is taking in short shoveling turnings at $33.50 delivered, off about $3.50 from ceiling.

Pittsburgh—Mills are setting down industrial and railroad scrap in dealers' yards but receipts are relatively light. Reasons are railroad activity normally drops off at this time of year and some fabricating plants generating heavy scrap grades are strikebound. If the steel strike continues much longer incoming industrial scrap will be reduced to a trickle as plants shut down for lack of certain steel products essential to operations. There isn't any sign of dealer distress as yet although some anxiety is evident. Mill sources say they haven't been offered any open-hearth grades below ceiling prices but all turning grades are reported offered at $2 to $3 per ton below ceiling, but without attracting takers. Actually the market is nominal in the absence of trading. It is expected there will be some softening in scrap prices upon resumption of steelmaking operations but the adjustment period is expected to last no more than three or four weeks.

Cleveland—Scrap is moving sluggishly with steelmaking operations in this district at a standstill. Prices, for the most part are nominal, reports of weakness lacking confirmation in actual transactions. Some scrap interests anticipate easing in the market when the strike ends and mills resume operations since mill inventories are estimated at 60 days and better. Such easiness, however, it is thought will be shortlived, and may not even affect the top grades of open-hearth scrap. Some sellers anticipate a firming up in turnings grades, currently being offered at $2 to $3 per ton under the government ceiling price without attracting buyers. Such firming, it is said, is a possibility in the light of the reduced iron ore tonnage that will be available to the furnaces over the remainder of the year as result of the current strike stoppage of shipments from the head of the lakes.

Easier scrap supply conditions are giving rise to a move looking toward discontinuance of tonnage allocation under government directives. Elim-

Standard Conveyors can speed operations

Keeping things moving — avoiding "bottle-necks" — on production, assembly, processing or packaging lines can be done better, faster, and cheaper *mechanically* with conveyors.

Your needs in conveyors — ranging from power and gravity conveyors, roller, belt, slat, chain, push-bar, sectional — to portable, self-contained conveyors — spiral chutes — pneumatic tube systems — can be met at Standard, with a conveyor experience record of more than 45 years. Write — Address Dept. ST-62.

STANDARD CONVEYOR COMPANY
General Offices: North St. Paul, Minnesota
Sales and Service in Principal Cities

Write Dept. ST62 for Standard's General Catalog and tell us what you want to convey.

ROLLER • BELT • SLAT • CHAIN • WHEEL
PUSH-BAR • SECTIONAL
PORTABLE CONVEYOR UNITS:
HANDIBELT • HANDIPILER
INCLINEBELT • LEVEL BELT • EXTENDOVEYOR
UTILITY BELT-VEYOR • HANDI-DRIVE
VERTICAL LIFTS • PNEUMATIC TUBE SYSTEMS

ENGINEERS

TO DESIGN, REDESIGN, OR DEVELOP YOUR PRODUCT

ENGINEERS

TO TOOL AND EQUIP YOUR PLANT FOR THE BEST PRODUCTION ECONOMICS

ENGINEERS

TO GET YOUR NEW PRODUCTION GOING AND KEEP IT GOING

ENGINEERS

TO REDUCE YOUR COSTS AND IMPROVE YOUR QUALITY

ENGINEERS, DESIGNERS, CONSULTANTS AND PRODUCTION SPECIALISTS

PIONEER ENGINEERING & MANUFACTURING CO., INC.

19662 JOHN R STREET
DETROIT 3, MICHIGAN

INQUIRIES PROMPTLY ANSWERED

ination of the Scrap Allocation Division of NPA is being urged by some large scrap buyers on the ground allocation no longer is necessary. However, some scrap trade interests oppose complete discontinuance of government allocations, arguing that should factory production and railroad scrap be entirely freed of government distribution controls, the large scrap consumers are likely to be favored in the matter of procurement at the expense of the smaller, and less influential buyers. This scrap men hold, will result in maldistribution of tonnage and give rise to undesirable procurement practices. The issue is to be discussed at a policy meeting in Washington this week of the NPA scrap authorities.

Detroit—The market is featureless as to prices. Ford is taking open-hearth, electric furnace and blast furnace material at ceiling. Foundry demand is dull.

Chicago—Longer the steel strike continues, the more depressed the scrap market is likely to be when the mills resume. Virtual standstill exists locally with the one operating steel producer holding up shipments.

St. Louis—Scrap market is in the doldrums. The two steel mills running are placing no orders and foundry demand continues low. Because there are few transactions, prices are unchanged except for persistent weakness in machine turnings and borings that began before the strike. Dealers are making no price concessions on bundles yet.

Birmingham — No market exists here at the moment for melting steel or any open-hearth grade due to the strike. Demand for most cast grades is light, largely because of sluggishness in production of soil pipe. The district is chiefly dependent upon agricultural scrap, little of which is finding its way to market now. Latest quotations list cupola cast at $42 and stove plate at $37.

Warehouse . . .

Warehouse Prices, Page 153

New York—Warehouse stocks are being depleted gradually, although distributors, in most cases, are trying to stretch out available tonnage as far as possible. This tends to curb over-buying. An exception is wire products. Some houses are overstocked. Nail prices are weak. Prices have been lowered on galvanized sheets, pipe and nails in line with the zinc pricing formula which is adjusted to the price of zinc.

Philadelphia — Warehouses' June business will be off noticeably from May. Orders are declining due to dwindling shipments from the mills. Most distributors are running out of the popular sizes of bars, shapes and heavy plates, stocks of which have been light for months.

Pittsburgh — Warehouses report over-all stock position still fairly comfortable but the steady drain on supplies without compensating receipts from the mills will be reflected in serious inventory depletion in a few weeks.

Washington—Distributors' exports of steel destined for manufacture of consumer durable goods abroad are banned by the Office of International Trade in an action supplementing the restrictive licensing policy announced immediately after the outbreak of the steel strike.

Cleveland—Unbalanced inventories are exerting a restricting influence on warehouse order volume and the ban on shipments to consumer durable goods makers, does not appear to mean much in the way of conserving supplies. One distributor is actively seeking a buyer for a substantial tonnage of low-silicon tonnage of low-silicon sheets it is holding.

Detroit — Distributors describe demand as less than frantic and believe most buyers will be forced to close presently because their customers in turn will be out of steel. Stocks are decidedly out of balance.

Chicago—Except for heavy plates, structurals and large sizes of hot-rolled and cold-finished bars, warehouse business is of lesser proportions than had been anticipated.

Canada . . .

Toronto, Ont.—Iron and steel production in Canada for April was below that of March but above April, 1951.

Pig iron production in April amounted to 214,330 net tons for a daily average of 86.2 per cent of rated capacity, compared with 240,755 tons or 93.7 per cent for March. April output included 172,341 tons of basic iron, 9139 tons of foundry iron and 32,850 tons of malleable iron.

For the first four months of this year pig iron production totaled 863,400 net tons against 826,073 tons in the like period of 1951.

Production of steel for ingots and castings during April amounted to 316,641 net tons, or a daily average of 97.8 per cent of rated capacity, compared with 339,396 tons or 101.5 per cent in March.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

2500 tons, bridge, Philadelphia, Bethlehem & New England railroad, Bethlehem, Pa., to Bethlehem Steel Co.

1300 tons, Portsmouth power station extension, Virginia Electric & Power Co., to Bristol Steel & Iron Works Inc., Bristol, Va., through Stone & Webster Engineering Corp., Boston.

110 tons, factory building, DuPont interests, Edgemoor, Del., to Bethlehem Fabricators, Bethlehem, Pa.

STRUCTURAL STEEL PENDING

3650 tons, steel superstructure, contract C-2a, Fitzgerald Expressway, Boston, Bethlehem Steel Co., low $2,119,648.65, rebid June 10.

3600 tons, hospital, Philadelphia, bids rejected; no date set for acceptance of new bids.

2936 tons, state bridgework in Berks and Schuykill counties, Pennsylvania, bids rejected; new bids July 18.

1600 tons, University of Washington teaching hospital; J. C. Bosepflug Construction Co., Seattle, apparently low $1,447,376, base, for first unit.

1235 tons, underpass structure, West Springfield, Mass.; bids June 23, state Department of Public Works, Boston.

850 tons, two warehouses, Letterkenny Ordnance Depot, Chambersburg, Pa., bids June 25.

564 tons, state bridgework, Fayette, Washington and Westmoreland counties, Pennsylvania, bids July 11.

500 tons, state bridgework, Allegheny county, Pennsylvania, bids July 11.

500 tons, prefabricated hangar; Anderson

Structural Steel Co., Los Angeles, apparently low $110,500, to King county, Washington, commissioners.

500 tons, gates, stop logs, pumping units, McNary dam project; Western Steel Mfg. Co., Boise, Idaho, low $296,497, to U. S. Engineer, Walla Walla, Wash.

470 tons, state bridge, Philadelphia, bids July 11.

REINFORCING BARS . . .

REINFORCING BARS PLACED

1200 tons, Tacoma light department headquarters building, to Northwest Steel Rolling Mills Inc., Seattle.

925 tons, ammunition warehouses, Bangor, Wash., naval depot; general contract to Grove, Shepherd, Wilson & Kruge, Seattle, low $2,245,751; steel, including shapes and rails, furnished by Navy.

670 tons, government hospital, Fairbanks, Alaska, to Northwest Steel Rolling Mills Inc., Seattle; general contract held by Grove, Shepherd, Wilson & Kruge, Seattle.

350 tons, cell block addition, Monroe, Wash., reformatory, to Bethlehem Pacific Coast Steel Corp., Seattle; general contract to Lease & Leigland, Seattle.

300 tons, Pierce county, Washington, Stuck river bridge, to Bethlehem Pacific Coast Steel Corp., Seattle.

125 tons, University Congregational church, Seattle, to Joseph T. Ryerson & Son Inc., Seattle; John H. Selien, Seattle, general contractor.

REINFORCING BARS PENDING

775 tons, underpass structure, West Springfield, Mass.; bids June 23, state Department of Public Works, Boston.

400 tons, apartment structure, Ketchikan, Alaska; general contract to L. E. Baldwin Inc., Seattle, low $1,492,376.

220 tons, state highway project, including reinforcing for four prestressed bridges, Newbury-Newburyport, Mass.; A. V. Taurasi Co. Inc., Somerville, Mass., low; New England Concrete Pipe Co. low on 102 beams for prestressed bridges $158,490 against office estimate of $187,950.

155 tons, state highway bridges, Essex-Gloucester and Manchester, Mass.; Gil Wyner Co. Inc., Malden, Mass., low $2,366,259.50.

100 tons, six highway bridges, Washington state; general contract to Goetz & Brennan, Seattle, low $61,219.

PLATES . . .

PLATES PLACED

512 tons, floor plates, Navy purchasing office, Washington, to Alan Wood Steel Co., Conshohocken, Pa.

390 tons, alloy plates, Navy purchasing office, Washington, to Great Lakes Steel Corp., Ecorse, Mich.

PLATES PENDING

2200 tons, tanks, General Service Administration, Somerville, N. J., bids July 15.

PIPE . . .

CAST IRON PIPE PENDING

100 tons, 1100 feet 20, 16 and 12-inch supply line; bids to Snohomish, Wash., July 1; smaller sizes out of stock.

RAILS, CARS . . .

LOCOMOTIVES PLACED

Nickel Plate, 5 diesel-electric switching locomotives, to Fairbanks, Morse & Co., Chicago. Engines will be built at the Beloit, Wis., plant.

RAILROAD CARS PLACED

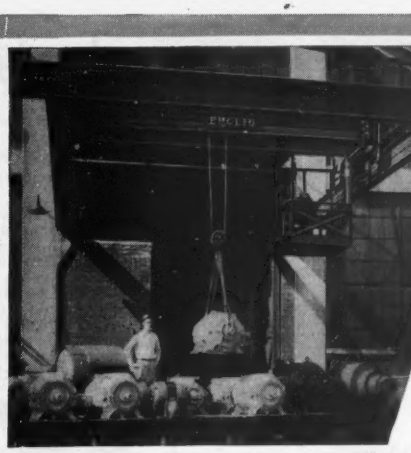
Appalachicola Northern, 100 pulpwood cars, to Bessemer, Ala., plant of Pullman Standard Car Mfg. Co., Chicago.

Gulf, Mobile & Ohio, 50 covered hopper cars, to Bessemer, Ala., plant of Pullman Standard Car Mfg. Co., Chicago.

New York, New Haven & Hartford, 6 rail diesel cars, to Budd Co., Philadelphia.

RAILROAD CARS PENDING

Chicago Transit Authority, 500 rapid transit cars; contemplated.



INSIDE
OUTSIDE
ALL 'ROUND
THE PLANT

For best results the type of material handling equipment selected must be determined by the nature of your business and its manufacturing operations.

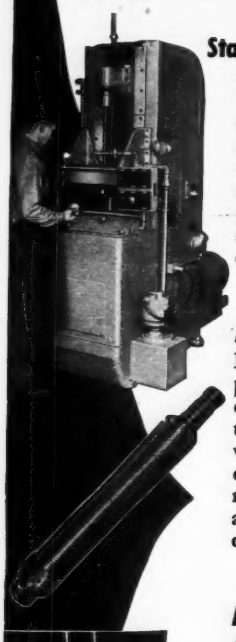
The size of products — the type of units involved — the sequence of operations — the nature of assembly activities and other factors must be considered.

There is a Euclid crane or hoist ideally adapted to a large majority of these situations — inside—outside—all 'round the plant. Let us discuss them with you. Meanwhile, let us send our catalogs.

THE EUCLID CRANE & HOIST COMPANY
1364 CHARDON ROAD, EUCLID, OHIO

EUCLID CRANES AND HOISTS
Raise Profits

LOWER broaching costs from START to FINISH — the *American* way



Start with *American* machines

American engineers have more than 50 standard internal and surface type machines to furnish you with the exact specifications to handle your broaching job. If yours is an unusual job, they can design and build a special machine to fit the operation.

Add *American* fixtures

Fast, accurate, and economical production depends to a large extent on the work holding fixture. American fixtures — whether for simple manual operation or for complex automatic clamping and ejection — are engineered to meet your demands.

Add *American* broaches

American broaches — that give precision work with any machine — have been especially designed for American machines. There is an American broach for nearly any broaching job. For speed, accuracy, and durability they can't be bettered.

Combine with *American* experience

American engineers and workmen insure you the best in the design and manufacture of all three broaching needs — the machines . . . the tools . . . and the fixtures. You can take advantage of their experience by broaching the American Way. A part print or a sample and hourly requirements of your problem will get a prompt recommendation from the company. Address Dept. S. No obligation of course.

American BROACH & MACHINE CO.
A DIVISION OF SUNDSTRAND MACHINE TOOL CO.
ANN ARBOR, MICHIGAN

perforated metals *for all* industry

STEEL AVAILABLE FROM ACCURATE'S STOCK

When it comes to perforating—metal, masonite, or any other material, check with Accurate Perforating Company. Accurate offers you a wide selection of perforating dies, quick and dependable service, best of all—a price that's hard to beat! For complete information, write today for your free catalog on Accurate perforated materials.

ACCURATE
PERFORATING COMPANY
1101 S. Kedzie Avenue
Chicago 12, Illinois

The *Cleveland Steel Tool Co.*
• PUNCHES • DIES • CHISELS • RIVET SETS •
IF IT'S *RIVETED* YOU *KNOW* IT'S SAFE
WE FEATURE SPECIAL PUNCHES & DIES
660 E. 82nd ST., CLEVELAND, O.

H&G Insert Chaser DIE HEADS

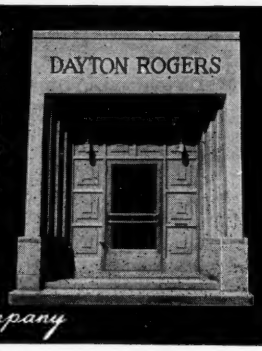
famous for accuracy and straightness of threads, low chaser costs, less downtime, more pieces per day.

THE EASTERN MACHINE SCREW CORP., 22-42 Barclay Street, New Haven, Conn.
Pacific Coast Representative: *A. C. Berbringer, 334 N. San Pedro St., Los Angeles, California.* Canada: *F. F. Barber Machinery Co., Toronto, Canada.*

SCREW MACHINE PRODUCTS *made to your order!*
SET SCREWS CAP SCREWS SPECIAL PARTS
STEEL • BRASS • STAINLESS • ALUMINUM
send us your specifications for quotation
SAMUEL J. SHIMER & SONS, Inc. Milton 2, Pa.

THEORY AND PRACTICE OF ROLLING STEEL . . By Wilhelm Tafel
312 Pages
Price Postpaid $4.50
Covers every angle of the design, construction and operation of the steel rolling mill.
THE PENTON PUBLISHING CO.
Book Department, 1213 W. 3rd St., Cleveland 13, O.

WORLD'S LARGEST PRODUCER of *Low Cost, Precision* DIE CUT STAMPINGS In Small Lots
YOUR INQUIRY INVITED



DAYTON ROGERS *Manufacturing Company*
2832 13th Ave. S., Minneapolis 7, Minn.

Here and There in Metalworking . . .

CONSTRUCTION—ENTERPRISE—ORGANIZATIONAL CHANGES

New Firm Reopens Tungsten Mine

William H. Hooper, Seattle, and associates under the name of Border Land Mining Corp. plan to reopen a tungsten mine in western Okanogan county, Washington. New equipment is being installed. The property was operated by a German syndicate up to about 35 years ago at which time the wolframite was shipped out on sleds during the winter. The new operators plan an air lift.

Hills-McCanna Enlarges Foundry

Hills-McCanna Co., Chicago, is closing its magnesium foundry from July 12 to July 27 to permit installation of new major equipment. This is part of the firm's foundry expansion program that adds 35,000 square feet of production area to the existing foundry.

Miller Organizes Clevecote Inc.

W. A. C. Miller III, president, Artisan Metal Works, Cleveland, established a subsidiary company, Clevecote Inc. This concern will specialize in the coating of metal surfaces with a silicone glaze, a process developed by Dow Corning Corp., Midland, Mich., and employing equipment and cleaners manufactured by Detrex Corp., Detroit. Production will start next month in a building at 11102 Avon Rd., Cleveland.

Automatic Foundry Names Agent

M. F. Becker & Associates, Chicago, were appointed as representatives for Automatic Foundry Equipment, Reichert Inc., Newark, N. J.

$3 Million Battery Plant Opens

Initial production at Willard Storage Battery Co.'s new plant at Allentown, Pa., climaxing the celebration of the company's 50th anniversary was announced by C. E. Murray, president. The $3 million plant has an annual capacity of 750,000 batteries. Willard has its main plant and headquarters offices in Cleveland.

Ray-O-Vac Merges with Subsidiary

Ray-O-Vac Co., Madison, Wis., merged with its former subsidiary, Manufacturers Battery Co. D. W. Tyrrell was named board chairman to succeed W. W. Cargill, retired. Mr. Tyrrell will continue as president. J. A. McIlnay was appointed vice president for sales and will continue to direct advertising activities of Ray-O-Vac. L. G. Berigan, formerly president of Manufacturers Battery Co., was named vice president for production of Ray-O-Vac. J. C. Ryan, formerly vice president for Ray-O-Vac Lighting Division, was named vice president in charge of operations. F. B. Ott, who will continue as secretary-treasurer of Ray-O-Vac, was elected vice president for finance.

Kuhlman Buys Transformer Firm

Kuhlman Electric Co., Bay City, Mich., purchased the assets of Queensboro Transformer & Machinery Co., Crystal Springs, Miss., and leased a transformer manufacturing plant which has been under construction in that city. The Crystal Spring property will be operated as a branch plant.

Tennessee Coal Awards Contract

Chemical Plants Division, Blaw-Knox Co., Pittsburgh, was awarded a contract by Tennessee Coal & Iron Division, United States Steel Co., Fairfield, Ala., for engineering design, procurement, and construction of ammonia unloading facilities. This project is an expansion of existing facilities which had been constructed previously by Chemical Plants Division.

Republic Supply Opens Branch

Republic Supply Co., Los Angeles, opened its million dollar northern division headquarters at 1919 Williams St., San Leandro, Calif. Malcom D. Jayred is the firm's northern division manager. The firm supplies over 80 different lines of industry with pipe, valves and fittings; abrasives; wire rope and rigging supplies; mechanical rubber goods; shop tools and equipment; heavy machinery.

Tool Maker Starts Expansion Project

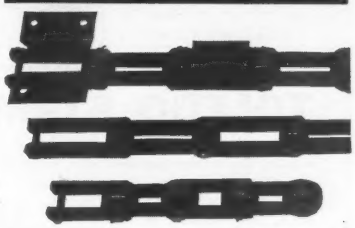
Vascoloy-Ramet Corp., subsidiary of Fansteel Metallurgical Corp., North Chicago, Ill., is erecting a building at Waukegan, Ill. This marks the start of a major expansion and improvement program for this firm. Although the immediate objective is to increase productive capacity by 50 per cent, the broader objective is to mechanize and streamline operations. When the program is completed late in 1952, the Vascoloy-Ramet plant will have

MATHEWS
CONVEYERS

Since 1905. Engineers and manufacturers of Conveyers and Conveyer Systems for the Metal-working Industries.
Three modern plants. Engineering Offices in All Principle Cities. There's an Engineering Sales Office near you.

MATHEWS CONVEYER CO.
ELLWOOD CITY · PENNSYLVANIA
SAN CARLOS · · CALIFORNIA
PORT HOPE · ONTARIO, CANADA

S.S. Conveyor chain to your specifications
Large or small quantities



We can assist you in many ways with most materials handling problems, and especially invite your inquiries along this line. Don't worry about delivery: we make it promptly.

ROCKFORD PRODUCTS COMPANY, INC.
11645 KLINGER, DETROIT 12, MICH.

Steel Makers Since 1871

STRIP STEEL

STANLEY

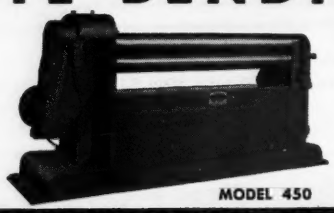
Reg. U.S. Pat. Off.

Hot Rolled—
Cold Rolled
Special Carbon—
Alloys

The STANLEY WORKS
New Britain, Bridgeport, Conn.
Hamilton, Ont.

REED PLATE BENDING ROLLS

18 MODELS, RANGING FROM 3 FT. x 14 GA. TO 8 FT. x ¼ IN. CAPACITY



MODEL 450

FEATURING
★ RUGGED, ALL-STEEL CONSTRUCTION
★ SILENT WORM GEAR DRIVE
★ BRONZE BEARINGS

WRITE FOR BULLETIN 76B

REED ENGINEERING COMPANY
1005 W. FAIRVIEW . . CARTHAGE, MO. U. S. A.
DESIGNERS AND MANUFACTURERS OF
MODERN METALWORKING MACHINES

PRODUCERS OF *Hot Rolled* ELECTRIC FURNACE QUALITY
BARS • SMALL SHAPES • STRIP
BOIARDI STEEL CORPORATION
300 Lower Market St. Milton, Penna.

THE BELMONT IRON WORKS
STRUCTURAL STEEL—BUILDINGS & BRIDGES
RIVETED—ARC WELDED Cable Address—Beliron
Engineers—Fabricators—Erectors—Contractors—Exporters
Shops—Philadelphia—Eddystone—Royersford
Main Office: Phila. 46, Pa.
New York Office—44 Whitehall St., N. Y. 4, N. Y.

TOLEDO STAMPINGS

Let us make your stamping problems our problems. Our Engineering Department has had many years of experience in development work and our production facilities include not only a modern press department, but facilities for copper hydrogen brazing and other types of welding and assembling work. We solicit your prints and inquiries.

Toledo Stamping and Manufacturing Co.
90 Fearing Blvd., Toledo, Ohio
Detroit Office: 12800 Puritan Ave., Detroit 27, Mich.
Chicago Office: 333 North Michigan Ave., Chicago, Ill.

mechanical
POWER PRESSES
FOR
ALL INDUSTRIES
ZEH & HAHNEMANN CO.
56 AVENUE A, NEWARK 5, N. J.

STEEL CASTINGS UP TO 8000 LBS.
SQUEEZER • ROLLOVER • LOOSE PATTERNS
OPEN CAPACITY. SEND INQUIRIES
Telephone TRinity 2-6000
RAY A. SCHARER & CO.
3000 E. Grand Blvd., Detroit 2, Michigan

OHIO LOCOMOTIVE CRANES
25 TO 50 TON CAPACITY

DIESEL • GASOLINE • ELECTRIC • STEAM
THE OHIO LOCOMOTIVE CRANE CO.
BUCYRUS, OHIO

IF METALWORKING PLANTS ARE YOUR PROSPECTS . . .

STEEL can put you in touch with the important ones, those that do more than 92% of the industry's business. Tell the buyers and specifiers in these plants of the machines or materials you have for sale through an "Equipment—Materials" advertisement. For rates write STEEL, Penton Building, Cleveland 13, Ohio.

modern facilities for production of carbide cutting tools, blanks and wear-resisting parts, wire and tube drawing dies, mining and rock tools, cast alloy cutting tools and custom-made intricate castings.

Carboloy Expands Sales Organization

Carboloy Department, General Electric Co., Detroit, expanded its Alnico permanent magnet field sales engineering organization in line with the company's permanent magnet plant expansion program at Edmore, Mich. The company has trained 32 sales engineers in the Atlantic, East Central, Michigan, Midwestern and Pacific districts. This field organization is augmented by permanent magnet specialists in Schenectady, N. Y., Cleveland, Detroit, Chicago and Newark, N. J.

Royston Expands Tulsa Warehouse

Royston Laboratories Inc., Blawnox, Pa., acquired additional facilities in Tulsa, Okla., for warehousing its industrial coating products to expedite deliveries to western and midwestern users.

Toledo Scale To Enlarge Plant

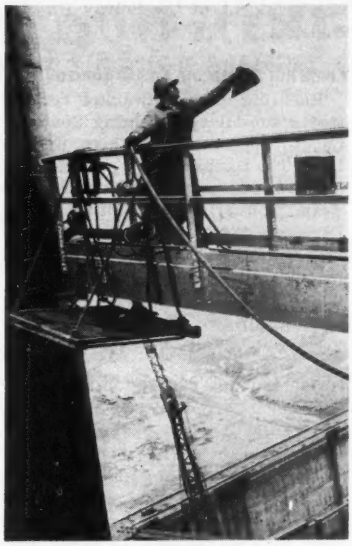
The Rochester, N. Y., plant of Toledo Scale Co. will be expanded to handle the output of new products. Started three years ago, the Rochester plant has steadily increased production and the variety of its products. Edward W. Plow recently was named general manager of the division.

Massey-Harris Buys African Firm

Massey-Harris Co. Ltd., Toronto, Ont., bought control in South African Farm Implement Manufacturers Ltd. which has plants at Johannesburg, Transvaal and Bulawayo, Rhodesia. L. T. Ritchie, former vice president of Massey-Harris Co., Racine, Wis., was appointed general manager of Safim.

Supply Firm Improves Facilities

Oil Well Supply Division, Los Angeles, subsidiary of U. S. Steel Co., completed improvement of facilities for selling machinery and supplies to the oil industry and made numerous personnel appointments in the California area. The firm moved into new offices at 4600 S. Santa Fe Ave., Los Angeles, opened a field store at Castaic Junction, completed construction of a building in Ventura, and enlarged and improved the Bakersfield and Long Beach stores, all in California. James Doan was appointed manager of the Castaic Junction store, and Nelson Harpold manager of the Ventura store. Additional salesmen were assigned to the Bakersfield, Los Angeles and Taft stores.



Catcher in the Sky

This iron worker is not a major-league ball player, but he is part of a rivet team building a blast furnace at U. S. Steel's Fairless Works, Morrisville, Pa. His skill at catching the white-hot rivets in the "catching can" is comparable to that of a major league outfielder

Pennsalt Merges Research Units

Research department of Sharples Chemicals Inc. will be integrated with the Research & Development Division of the parent company, Pennsylvania Salt Mfg. Co., Philadelphia. The integration will occur between June 15 and Sept. 15. Laboratory facilities are being extended.

Rigidized Names West Coast Agent

Rigidized Metals Corp., Buffalo, appointed Electric Steel Foundry as its distributor on the West Coast. This firm, a well-known distributor of stainless steel, maintains offices in Portland and Eugene, Oreg., Vancouver, B. C., Seattle, San Francisco and Los Angeles.

Quaker Rubber Opens New Branch

Quaker Rubber Corp., a division of H. K. Porter Co. Inc., Philadelphia, established a branch warehouse and sales office at 30 S. Mill St., Lockland 15, Cincinnati.

Canada To Get $12 Million Refinery

American Zinc Refinery Co. will soon start work on a $12 million plant in the industrial region of Lake St. John, Que. Premier Duplessis made the announcement at a press conference in Quebec, stating that

QUANTITY PRODUCTION OF GREY IRON CASTINGS

ONE OF THE NATION'S LARGEST AND MOST MODERN PRODUCTION FOUNDRIES

ESTABLISHED 1866
THE WHELAND COMPANY
CHATTANOOGA 2, TENN.

WARD STEEL CO.
PROMPT WAREHOUSE SERVICE ONLY
Most Complete Stock in America of
BLUE TEMPERED SPRING STEEL
We believe that the way to sell is to carry a stock which permits satisfying any reasonable warehouse demand.
87A Rindge Ave. Ext.
Phone UN 4-2460
CAMBRIDGE 40, MASS.
Branches:
3042 3058 W. 51st Street, CHICAGO, ILL.
Phone: Grove Hill 6-2600
Fenner Street, Providence, R. I.
Phone: Gaspee 1-5573, 1-8573

work on the project would begin as soon as materials and machinery are available. The premier said establishment of two or three other refineries is possible in the future.

Crucible Steel Opens Warehouse

Crucible Steel Co. of America, New York, opened its new warehouse and branch office at 4920 E. Nevada, Detroit. C. J. Ryan is manager.

Brunner Plans Increased Production

Brunner Mfg. Co., Utica, N. Y., is planning expansion of its product line to increase production of enclosed and semienclosed refrigeration units.

The company has an order backlog of $1 million. Heaviest current demand is for air conditioning units. New production activities will require new machinery and rearrangement of equipment already installed.

American Radiator and Acme Merge

Business of Acme Metal Products Corp., Blue Island, Ill., manufacturer of kitchen sinks and cabinets, was consolidated with the business of American Radiator & Standard Sanitary Corp., New York. Activities formerly carried on by Acme will be conducted as a division of American Standard.

New York Belting Names Distributor

New York Belting & Packing Co., Passaic, N. J., manufacturer of belting, hose, packing and other industrial rubber goods, appointed Rocky Mountain Machinery Co., Salt Lake City, Utah, as its distributor in that area.

Little Moves Mechanical Division

Arthur D. Little Inc., industrial research and engineering firm, will move its Mechanical Division to a larger building in the West Cambridge, Mass., industrial area. Administrative and research laboratories will remain at 30 Memorial Dr., Cambridge, Mass.

Solvay Divisions Consolidated

Solvay Process Division and Solvay Sales Division were consolidated and are now known as Solvay Process Division, Allied Chemical & Dye Corp., New York. The executive sales office was moved to 61 Broadway and consolidated with Solvay Process executive office. A. B. Chadwick and Carlton Bates will continue, respectively, as president and vice president in charge of operations of Solvay Process. H. F. Merritt, formerly executive vice president of Solvay Sales Division, is vice president of the Solvay Process Division.

Koehring Southern Co. Organized

Koehring Co., Milwaukee, organized a subsidiary, Koehring Southern Co., to operate its southern properties. The company took possession of a $500,000 plant at Chattanooga, Tenn., formerly operated by Norge Division, Borg-Warner Corp. Koehring will spend another $1 million for machine tools to equip the plant for manufacture of power shovels and cranes. N. J. Decker is southern plant manager.

Taylor Expands Production Facilities

Taylor Instrument Cos., Rochester, N. Y., is engaged in an extensive reorganization of its manufacturing facilities following completion of building No. 49. The program will continue more than a year and will cost several hundred thousand dollars. It is expected to result in greatly increased production efficiency. Among major changes are the expansion of the Machine Division and setting up of a panel manufacturing department.

Arlington Industries Chartered

Arlington Industries Inc. was granted a charter to engage in the iron and steel business in Texas. Home office is in Ft. Worth, Tex., but will be moved to Arlington, Tex., on July 1. Texas agent is William Boustead, 2260 Hurley, Ft. Worth.

Spring Maker Appoints Agent

American-Fort Pitt Spring Division, H. K. Porter Co. Inc., Pittsburgh, appointed John J. Gillis Co., Boston, as its sales representative in New England. American-Fort Pitt produces hot and cold wound springs for industrial and railroad applications.

Royal Enlarges Sales Organization

Royal Metal Mfg. Co., Chicago, producer of metal furniture, expanded its sales organization. The number of sales territories was increased from 19 to 26 while the number of salesmen was increased from 27 to 34.

Superheater Plans Expansion Project

Superheater Co., Sherbrooke, Que., will start construction soon of a $1.5 million annex, part of an eventual $4 million expansion program, says Leo Cadorette, president, Municipal Industrial Relations committee.

Nooter Establishes Metallizing Firm

Nooter Corp., St. Louis, custom fabricator of steel and alloy plate processing equipment, established St. Louis Metallizing Co., 625 S. Sarah St., that city. Formerly the Metallizing Division of Nooter Corp., the newly formed company will retain the same personnel, equipment and management. Walter B. Meyer is president.

Ferguson Buys Elliott Process

Purchase of all process and patent rights covering the Elliott oxygen system for production of tonnage oxygen and high-purity nitrogen, and availability of complete plants of this type on a turn-key contract basis was announced by H. K. Ferguson Co., Cleveland. It is expected that the use of oxygen will increase greatly the output and economy of open-hearth furnaces, blast furnaces, bessemer converters and electric furnaces. Other possible uses include the smelting of sulphur-bearing ores, such as nickel, copper, zinc and lead.

GE Schedules Utica Plant Opening

General Electric Co., Schenectady, is expected to open its new $15 million electronics plant in Utica, N. Y., between Oct. 1 and Jan. 1. Groundbreaking for the plant took place about a year ago. It is expected that a majority of the employees to be hired will be at work in the plant by December.

Fasterner Firm Builds Addition

Northwest Bolt & Nut Co., Seattle, is erecting a second addition to its new plant at 4250 Eighth Ave., that city.

GENERAL SALES MANAGER

for Growing Steel Mill

Fine opportunity for aggressive young man with personal experience in digging up business in the territory, and in organizing and directing men to do the same. This partially integrated mill has a major expansion program under way, particularly for flat rolled products, and must have a hard-hitting group to sell the output in a post-boom market. Give full details of experience and salary expectation. Replies will be held in strict confidence. Our men know of this ad. Box 525, STEEL, Penton Bldg., Cleveland 13, Ohio.

RAILROAD EQUIPMENT—*FOR SALE*

STANDARD GAUGE FREIGHT CARS

Box, Single Sheathed, 50-Ton
Cabooses, Eight Wheel, Cupola Type
Flats, 40-and 50-Ton, Steel Underframe, 40'0"
Gondolas, Composite, 40-Ton Capacity
Gondolas, Composite or All Steel, 50-Ton and 70-Ton
Hoppers, Covered, All-Steel, 70-Ton
Hoppers, Twin, All-Steel, 50-Ton, Cross Dump
Hoppers, All-Steel, 70-Ton, Cross Dump
Tank, 3,000-Gallon, High Pressure

EXTRA LONG FLAT CARS

40 & 50-Ton Capacity, Length 70' and 74'

STANDARD GAUGE AIR DUMP CARS

Four—30-Yd., 50-Ton Cap., All Steel, Side Dump (Drop Door)
End Dump, 20-Yd., 50-Ton Drop Door **End** Dump, 10-Yd., 30-Ton Lift Door
Side Dump, 16-Yd., 30-Ton Lift Door

STANDARD GAUGE DIESEL LOCOMOTIVES

One Plymouth Diesel-Mechanical, 65-Ton, Type 0-6-0, Built 1940

One 1500 H.P., 120-Ton, Road Switcher, Diesel-Electric, Type 0-4-4-0

Send us your inquiries **WE BUY FREIGHT CARS FOR DISMANTLING** ***Send us your offerings***

IRON & STEEL PRODUCTS, INC.

REPAIR PARTS For All Types of Freight Cars

General Office
13462 S. Brainard Ave.
Chicago 33, Illinois
Phone: BAyport 1-3456

New York Office
50-D. Church Street
New York 7, N. Y.
Phone: BEekman 3-8230

STORAGE TANKS
6,000 Gallon
8,000 Gallon
10,000 Gallon

"ANYTHING containing IRON or STEEL"

CLASSIFIED

Opportunities

CANADIAN FIRM WISHES TO DIVERSIFY OPERATIONS by obtaining license to manufacture item(s) for the Canadian market. Now engaged in aircraft part manufacturing and assembly. Desire product having yearly volume $100,000 to $500,000 range. Will add special purpose capacity if warranted. Write Box 530, STEEL, Penton Bldg., Cleveland 13, Ohio.

Positions Wanted

BLOOMING OR SLAB MILL SUPERINTENDENT, Roller, or Instructor. 16 years diversified mill experience, 10 years as top roller. Can furnish excellent references. Will go anywhere. Write Box 531, STEEL, Penton Bldg., Cleveland 13, Ohio.

DESIGN AND PLANT ENGINEER AVAILABLE. M.E., E.E. Experienced in equipment design and plant engineering, particularly as it applies to plants producing welded steel tubing. Executive type of mature age, 30 years experience. Capable to assume responsibility and qualified to manage those phases of engineering. Write Box 524, STEEL, Penton Bldg., Cleveland 13, Ohio.

Help Wanted

WANTED—ASSISTANT PLANT ENGINEER Familiar with maintaining mechanical and electrical equipment. Write Box 521, STEEL, Penton Bldg., Cleveland 13, Ohio.

STEEL SALESMEN WANTED
We need established commission salesmen to represent us in New York, New England, Canada, Detroit, Indianapolis, Cincinnati, St. Louis, Milwaukee and Cleveland. Write Box 528, STEEL, Penton Bldg., Cleveland 13, Ohio.

WANTED
STEEL FABRICATING PLANT MANAGER

Wonderful opportunity. Must have excellent record of experience. Must be capable of completely supervising plant operations and coordinating engineering department with plant. Ability to spot check estimates desirable. A permanent position for right man. Starting salary $10,000 per year and bonus. Southern city of 250,000. Do not apply if you are not top man. Write, giving full details. Replies kept strictly confidential. Box 529, STEEL, Penton Bldg., Cleveland 13, Ohio.

NEW **PIPE** Warehouse Stocks of STANDARD • MERCHANT LAP WELD • SEAMLESS BUTTWELD • SPIRAL WELD
L.B. FOSTER CO.
HOUSTON 2, TEX. CHICAGO 4, ILL.
PITTSBURGH 30, PA. NEW YORK 7, N.Y.

FOR SALE
1—Riehle 80,000# *Tensile & Compression* Testing Machine
Immediate Delivery
Reasonable
CONSOLIDATED PRODUCTS COMPANY, INC.
15-21 Park Row New York 38, N. Y.

FOR SALE
EL. WELD, HRP STEEL TUBING
15,000 ft. 1"-16 ga. x 10 ft. @ 8.50 C ft.
15,000 ft. 1¼ 16 ga. x 12 ft. @ 9.25 C ft.
2400 ft. 1¾ 14 ga. x 4 ft. @ 14.00 C ft.
LOCK SEAM STEEL TUBING
60,000 ft. ¾ x .020 x 15 ft. Galv. @ 6.00 C ft.
16,000 ft. 1¼ x .020 x 2 ft. @ 5.00 C ft.
TOP IND. SALES
130 West 18th Street, New York City

MICHIGAN SALES OUTLET
Sales Engineering Company has facilities for representation of one more quality account, requiring both sales and field engineering efforts. We are comprehensively acquainted with Purchasing, Plant Engineering, and Master Mechanic's Divisions of Automotive and Chemical Industries.
Write Box 527, STEEL,
Penton Building Cleveland 13, Ohio

20 YEARS SERVICE
To Top COMPANIES and EXECUTIVES
As the National Clearing House for QUALITY in men and positions —assures you the utmost in understanding and confidential handling of YOUR requirements for a MAN or a POSITION. Write for details:
B. T. BAGLEY
CADILLAC EMPLOYMENT AGENCY
Suite 614 220 S. State St.
Chicago 4, Ill. WAbash 2-4800

OPEN TIME
300 TON PRESS BRAKE
Will bend 20' x ¼" to 6' x ⅜" Pl.
ST. JOSEPH STRUCTURAL STEEL CO.
Box 68 Sta. "A" St. Joseph, Mo.

FORGING & DIE SINKING EQUIPMENT
All Kinds We Buy—We Sell Contact Us First
WILKIE DIE PRODUCTS COMPANY
Specialists in Forging Equipment
1186 Hawthorne Blvd. Grosse Pointe Woods 30, Mich.
Phone (Detroit) TUxedo 1-7140

"We Buy . . . We Sell!"
STAINLESS STEEL
PLATE
SHEET
ROD
PIPE
TUBES
BAR
One of The LARGEST STOCKS in The East. Immediate Delivery—Warehouse Stock. One Pound To A Carload. Submit Your Inquiry
Wire-Write-Phone
JANDRU Steel Corp.
(MILL DISTRIBUTORS)
(DEPT. S) 131 BRUCKNER BOULEVARD
NEW YORK 54, NEW YORK
PHONE: CYPRESS 2-5617

FOR SALE OR FOR RENT
2—Milwaukee Briquetting Presses with electrical equipment. Model 350. New in 1943.
1—Jeffrey MT-26 Crushing Mill for turnings, with motor.
1—Logeman Scrap Baling Press. Model 36PCX, size of box 52 x 48 x 42; complete with hydraulic pump, oil tank, operating valves.
Above equipment used very little.
PAUL SINOWAY
1854 W. WEBSTER AVE.
CHICAGO 14, ILL. BRUNSWICK 8-5550

National Metal

LEADING SPECIALISTS IN

COLD ROLL FORMING

SINCE 1902

Announce

THE AVAILABILITY OF A PORTION OF OUR MODERN FACILITIES FOR D.O. PRODUCTION

Our broad metal forming experience covers shapes that can be fabricated by Cold Rolling steel, bronze, aluminum, stainless steel.

Comprehensive statement of our available capacity at your request. With requests for specific quotations, please include your blue print.

National Metal
PRODUCTS CO.
1025 CHATEAU ST.
PITTSBURGH 33, PA.

NATIONAL METAL PRODUCTS COMPANY

Since 1902 Since 1902

Manufacturers of

• Zinc and Bronze Weatherstripping • Stampings • Metal Frame Screens • Special Rolled Mouldings • Bronze and Aluminum Thresholds • Aluminum Awnings • Window Guard Units for Mobile Machine Shop • Zinc Products • Quonset Hut Window Units • Industrial Polishing.

Another Step Toward Expansion in Canada

When officials of the Acme Steel Co. of Canada Ltd., subsidiary of Acme Steel Co., Chicago, broke ground for a $160,000 warehouse at Montreal, Que., it marked the second major step in the current expansion program of the firm

Reynolds Names Arkansas Plant

Reynolds Metals Co., Louisville, named its newest aluminum reduction plant, under construction in Arkansas, in honor of the late Judge Robert P. Patterson who was killed in a plane crash at Elizabeth N. J. Judge Patterson, former secretary of war, had served as a member of Reynolds Metals board of directors and as its general counsel since 1947.

Master Products Enlarges Building

Master Products Mfg. Co. is constructing an addition to its present building at 3480 E. 14th St., Los Angeles. Office equipment, appliances, convoluted bellows, and aircraft subassemblies are manufactured.

Thompson Trailer Plans Addition

Thompson Trailer Corp., Greenwood road, Pikesville, Md., manufacturer of aluminum commercial trailers and other products, will construct a 30,000-square-foot addition, which will double the company's present space.

Rust-Oleum Appoints Distributors

Rust-Oleum Corp., Evanston, Ill., manufacturer of rust preventives, appointed as its distributors in their respective areas: Galen Paint Co., Toms River, N. J.; Metropolitan Paint Co., Washington; Industrial Equipment & Engineering, Pittsfield, Mass.; Summers Hardware & Supply Co., Johnson City, Tenn.; Masek Auto Supply Co. Inc., Gering, Nebr., and Casper, Wyo.; Adkins & Douglas Co., Hurlock, Md.; Stebbins-Anderson Co. Inc., Towson, Md.; Parsons Bros. Inc., Bridgeport, Conn.; Carey Bros., White Plains, N. Y.; M. A. Hartnett Inc., Dover, Del.; Superior-Sterling Co., Bluefield, W. Va.

Airframe Mfg. Opens Two Plants

Airframe Mfg. Co. opened two plants, one at 2619 N. Ontario Ave., Burbank, Calif., producing aluminum castings. Managers are G. E. Newton, R. L. Osborne and J. G. Fay.

Equipment Maker Buys Plant Site

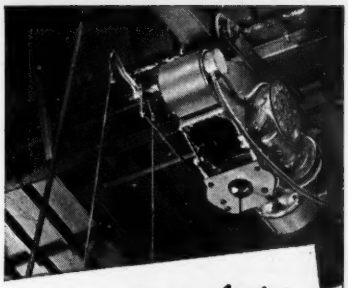
American Instrument Co. Inc., Silver Springs, Md., manufacturer of laboratory and scientific equipment, acquired 100 acres at Savage, Md., as a site for a future plant. A plant containing in excess of 100,000 square feet is contemplated, although work may not be undertaken for a few years. William H. Reynolds is president.

Diamond Chain Appoints Agent

Diamond Chain Co. Inc., Indianapolis, appointed Hickinbotham Bros. Ltd., Stockton, Calif., as its distributor in that area. Diamond Chain manufactures roller chains, sprockets and flexible shaft couplings.

Hoover Moves Chicago Departments

Advertising and patent departments, Hoover Co., moved to 20 N. Wacker Dr., Chicago 6.

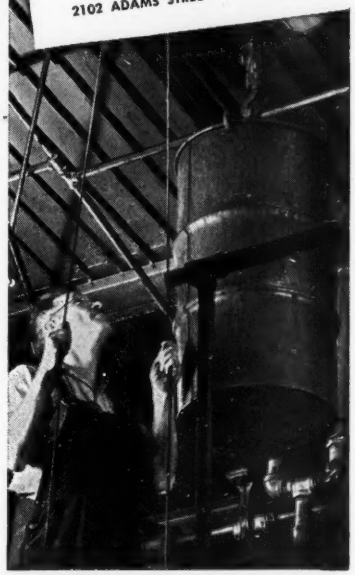


Modern Hoist Logic:

3-2 = LOWER COSTS!

—Yes, rock-bottom handling costs—*and* more output per hour! Here's the record: Heavy drums of chemicals had to be lifted to a raised vat—and lifted fast. The block and tackle formerly used required 3 men to get the proper lift speed. This ½-ton Reading Electric Hoist paid for itself in 2 months by keeping 2 men on their regular jobs and letting the third raise drums alone—in half the previous time! Let a Reading engineer help you get the same kind of handling results with a fast, smooth-working Reading Electric Hoist. Drop us a line today for full details. No obligation, of course.

READING CRANE & HOIST CORP.
2102 ADAMS STREET • READING, PA.



READING HOISTS

Advertising Index

Accurate Perforating Co. 166
Alan Wood Steel Co. 90
Allegheny Ludlum Steel Corporation 132
Aluminum Company of America 22, 23
Aluminum Import Corporation 137
American Broach & Machine Co. 166
American Optical Co. 139
American Screw Co. 144
American Shear Knife Co. 160
American Zinc, Lead & Smelting Co. 156
American Zinc Sales Co. 156
Andrews-Alderfer Co. 104
Angier Corporation 98
Arcos Corporation 114, 115
Associated Spring Corporation 28
Atlas Car & Mfg. Co., The 130

Babcock & Wilcox Co., The, Refractories Division 83
Baird Associates, Inc. 116
Baldwin-Lima-Hamilton Corporation 102, 103
Barnes-Gibson-Raymond, Division of Associated Spring Corporation 28
Barnes, Wallace, Co., Division of Associated Spring Corporation 28
Barnes, Wallace, Co., Ltd., The, Division of Associated Spring Corporation 28
Belmont Iron Works, The 168
Bethlehem Steel Co. 1
B-G-R Cook Plant, Division of Associated Spring Corporation 28
Birdsboro Steel Foundry & Machine Co. 125
Black & Decker Mfg. Co., The 16
Boiardi Steel Corporation 168
Brainard Steel Division, Sharon Steel Corporation 121
Bridgeport Brass Co. 30, 31
Brooks Oil Co., The 113
Buffalo Forge Co. 155

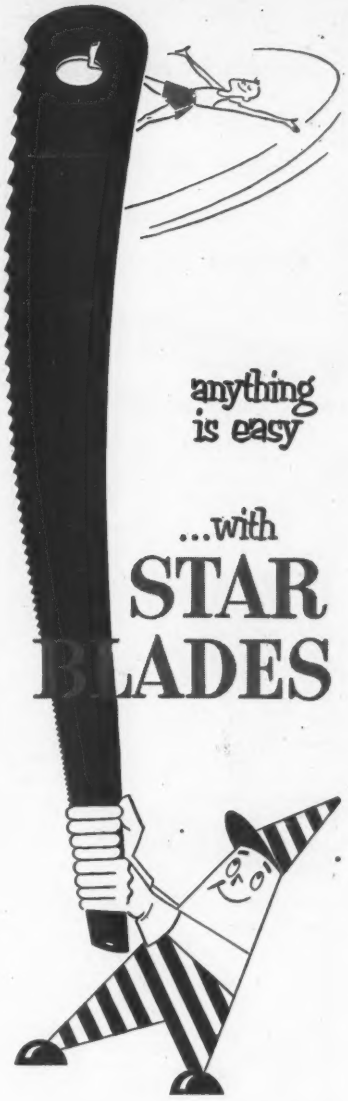
Cadillac Employment Agency 171
Camcar Screw & Mfg. Corp. 106
Carpenter Steel Co., The 152
Chain Belt Co. 24
Cincinnati Grinders, Inc. 51
Clearing Machine Corporation 140
Clemson Bros., Inc. 173
Cleveland Cap Screw Co., The 96
Cleveland Crane & Engineering Co., The, Cleveland Tramrail Division 120
Cleveland Quarries Co., The 124
Cleveland Quarries Co., The, The Sterling Grinding Wheel Division 8, 9
Cleveland Steel Tool Co., The 166
Cleveland Tramrail Division, The Cleveland Crane & Engineering Co. 120
Cleveland Twist Drill Co., The 70
Cold Metal Products Co., The 87, 88
Cone-Drive Gears Division, Michigan Tool Co. 17
Consolidated Products Co., Inc. 171
Cross Co., The 67

Dayton Rubber Co. 13
DoAll Co., The 110, 111
Dunbar Brothers Co., Division of Associated Spring Corporation 28

Eastern Machine Screw Corp., The 166
Eastman Kodak Co., X-ray Division 131
Euclid Crane & Hoist Co., The 165

Federal Products Corporation 136
Felters Co., The 161
Ferry Cap & Set Screw Co., The 14
Foster, L. B., Co. 171
Frasse, Peter A., & Co., Inc. 159

Continued on following page



anything is easy

...with STAR BLADES

Whatever your metal cutting problem, there's a STAR BLADE that's just the *right* blade to make your job easy, efficient and fast.

Your supplier has the complete STAR line of hacksaw blades, frames and metal-cutting band saws, the line most people buy.

Sold only through recognized distributors

CLEMSON BROS., Inc.
MIDDLETOWN, N.Y., U.S.A.

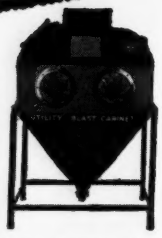
Makers of Hand and Power Hack Saw Blades, Frames, Metal Cutting Band Saw Blades and Clemson Lawn Machines.

1083A

Here's How

Pangborn Solves these Problems with this Modern Equipment

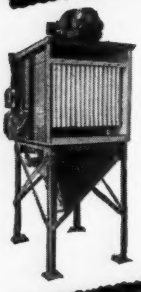
BLAST CLEANING!



Blast Cleaning Cabinet cleans rust, grime, dirt, paint, etc., from metal parts. Produces a smooth surface on pieces up to 60" x 36". Models from $319.00 and up.

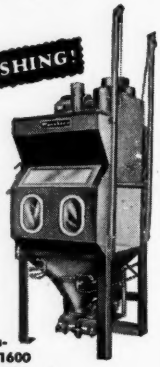
Blast Cleaning Machine removes rust, dirt, scale, etc., is ideal for maintenance work. Cleans large objects such as bridges, tanks, etc., before painting. Six sizes, portable or stationary from $170.00 and up.

DUST COLLECTING!



Unit Dust Collector stops dust at source, minimizes machine wear and tear, reduces housekeeping and maintenance costs. Solves many grinding and polishing nuisances. Models from $286.00 and up.

PRECISION FINISHING!



Hydro-Finish Cabinet uses liquid blast to polish, clean and finish molds, dies, etc. Removes scale, discoloration with minimum hand work. Holds tolerances to .0001". Models from $1410.00 and up.

Write for details on these machines to: Pangborn Corp., 1600 Pangborn Blvd., Hagerstown, Md.

Pangborn

Look to Pangborn for the latest developments in Blast Cleaning and Dust Control Equipment

Advertising Index

Concluded from preceding page

Gibson, William D., Co., The, Division of Associated Spring Corporation 28
Gray Iron Founders' Society, Inc. 108
Great Lakes Steel Corporation 56
Gulf Oil Corporation 94
Gulf Refining Co. 94

Hercules Powder Co., Inc. 11
Horsburgh & Scott Co., The 12
Hyde Park Foundry & Machine Co. 165
Hydraulic Press Mfg. Co., The 93

Illinois Clay Products Co. 91
Industrial Brownhoist Corporation 135
Industrial Filtration Co. 81
Inland Steel Co. 42
International Nickel Co., Inc., The 38
Iron & Steel Products, Inc. 171

Jandru Steel Corp. 171
Jones & Laughlin Steel Corporation 117

Kearney & Trecker Corporation 69
Keystone Steel & Wire Co. 10
Korhumel Steel & Aluminum Co. ..... Inside Front Cover

Latrobe Steel Co. 59
Lavallee & Ide, Inc. 63
Leake Stamping Co., The 95
Lincoln Electric Co., The 41

McDanel Refractory Porcelain Co. 134

Magnaflux Corporation 3
Mahon, R. C., Co., The 119
Manross, F. N., & Sons Co., Division of Associated Spring Corporation 28
Master Electric Co., The 105
Master Products Co., The 134
Mathews Conveyer Co. 167
Mesta Machine Co. 52
Michigan Tool Co., Cone-Drive Gears Division 17
Milwaukee Division of Associated Spring Corporation 28
Monarch Machine Tool Co., The 29

National Carbon Co., A Division of Union Carbide & Carbon Corporation 84
National Machinery Co. 20
National Metal Products Co. 172
National-Standard Co. 32
National Steel Corporation 56
Nilson, A. H., Machine Co., The 133
Norton Co., Machine Division 26, 27

Ohio Crankshaft Co., The 2
Ohio Division of Associated Spring Corporation 28
Ohio Locomotive Crane Co., The 168
Ohio Seamless Tube Co., The 99

Pangborn Corp. 174
Pannier Corporation, The 6
Pioneer Engineering & Manufacturing Co., Inc. 164
Pittsburgh Coke & Chemical Co. 97
Pittsburgh Gear Co. 92
Public Service Electric & Gas Co. 101

Raymond Manufacturing Co., Division of Associated Spring Corporation 28
Reading Crane & Hoist Corp. 173
Reed Engineering Co. 168
Reliance Electric & Engineering Co. 5
Republic Steel Corporation 123
Rockford Products Co., Inc. 167
Roebling's, John A., Sons Co. 21
Rogers, Dayton, Manufacturing Co. 166
Roto-Finish Co. 109
Russell, Burdsall & Ward Bolt & Nut Co. 60
Ryerson, Joseph T., & Son, Inc. 34

St. Joseph Structural Steel Co. 171
Scharer, Ray A., & Co. 168
Security Locknut Corporation 143
Sharon Steel Corporation 7
Sharon Steel Corporation, Brainard Steel Division 121
Shimer, Samuel J., & Sons, Inc. 166
Standard Conveyor Co. 163
Standard Pressed Steel Co. 18, 19
Stanley Works, The 167
Sterling Grinding Wheel Division of The Cleveland Quarries Co. 8, 9
Stuart, D. A., Oil Co., Ltd. 129
Sun Oil Co. 64

Tennessee Products & Chemical Corporation 4
Timken Roller Bearing Co., The ..... Back Cover
Toledo Stamping & Manufacturing Co. 168
Towmotor Corporation 15
Tube Making Machines, Ltd. 138

Union Carbide & Carbon Corporation, National Carbon Co. 84
United Screw & Bolt Corporation 37
United States Steel Co. 126
United States Steel Corp., Subsidiaries 126
United States Steel Supply Division, United States Steel Co. 126
U. S. Stoneware Co., The 118

Van Huffel Tube Corporation 25

Ward Steel Co. 169
Westinghouse Electric Corporation 107
Wheland Co., The 169
Wilkie Die Products Co. 171
Willson Products, Inc. 128
Wilson, Lee, Engineering Co., Inc. ..... Inside Back Cover
Winsmith, Inc. 122
Wolverine Tube Division 100
Wyckoff Steel Co. 162

York Engineering & Construction Co. 112
York-Gillespie Manufacturing Co. 112

Zeh & Hahnemann Co. 168

Table of Contents Page 5

Classified Advertising Pages 170, 171